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JOHN C. WILKERSON



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INTRODUCTION

The Naval Oceanographic Office (NAVOCEANO) employs eight survey ships and three aircraft that are uniquely configured to collect and process oceanographic data (including geophysical, acoustic and hydrographic) in support of its primary mission to provide oceanographic information to the Fleet and Shore Establishment Commands.

In order to support its product requirements, NAVOCEANO has developed and maintains extensive data files. Once the specifications for oceanographic measurements have been determined by the Laboratories and Systems Commands, NAVOCEANO searches its data files for information of interest, designs and conducts surveys as needed to add to these files, and produces and distributes the relevant products to the Fleet or Shore Establishment.

NAVOCEANO also interacts with other data libraries including the National Oceanographic Data Center (NODC), the DoD Library of Gravity Data and the DoD Library of Positional Data Bases held by the Defense Mapping Agency Aeronautical Center (DMAAC), and the DoD Library of Bathymetric Data held by the Defense Mapping Agency Hydrographic Center (DMAHC). NAVOCEANO is the repository of the DoD Library of Geomagnetic Data and the Oceanographic Data Library (Navy).

This publication includes a table of NAVOCEANO's unclassified major and minor data holdings, together with a data summary sheet, global distribution chart, and narrative description for each of these holdings. *

This document will be updated yearly to reflect new data added to the files.

*NAVOCEANO's classified data holdings are summarized in TN 3007-S1-77.

Data File Summary

Major Holdings

TITLE	TOTALS	FORMAT	PERIOD	COVERAGE	SOURCE	BACKLOG
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ACOUSTIC DATA

Bottom Loss/Prop Loss	16K Sta.	Analog Digital	1966-1976	Worldwide	MGS Navocean Surveys	44 Sta.
Volume Reverb	91 Obs	Analog Magtape	1975-1976	N. Atl. N. Pac. Carib. G. Mex.	Navocean Surveys	91 Obs
Ambient Noise	397 Obs	Analog Magtape	1971-1976	Worldwide	Navocean Surveys	227 Obs

GEOPHYSICAL/GEOLOGICAL DATA

12 KHZ Bathymetry-Random	367K Miles	Digital Compressed	1966-1977	N. Hemisphere	Navocean Surveys	None
35 KHZ Bathymetry-Random	460K Miles	Analog Records	1968-1977	Worldwide	Navocean Surveys	6 Cruises
Seismic Profile	500K Miles	Analog Records	1965-1977	Worldwide	Navocean Surveys	2 Cruises not microfilmed
Magnetic	10.5M Miles	Digital 40% Analog 60%	1953-1977	Worldwide	Navocean Surveys	11 Ship Yrs
Sediment Sample	114K Obs	Digital Card Image	1850-1977	Worldwide	Literature Nav. Charts NOO Surveys	11K Obs
Core Sample Index	39K Cores	Digital Compressed	1883-1975	Worldwide	Institutions Navy Surveys	None

PHYSICAL DATA

BT-Expendable	291K Sta.	Digital Compressed	1964-1976	Worldwide	National International Cruises	None
BT-Mechanical	779K Sta.	Digital Compressed	1940-1976	Worldwide	National International Cruises	None
Current Station	806 Records	Digital Compressed	1966-1977	Worldwide	Navocean Surveys	20 Records
Current Surface	4.2M Obs	Digital Compressed	1870-1976	Worldwide	Ship set and drift reports	7K Obs
Ocean Station	507K Stas	Digital Compressed	1920-1975	Worldwide	National International Cruises	40K Sta.
SVSTD Station	19K Sta.	Digital Compressed	1970-1977	Worldwide	Navocean Surveys	11K Sta
Surface Temperature	166K Miles	Digital Compressed	1971-1976	N. Hemisphere	Navocean Surveys	None
Sea Ice	53K Obs 1200 Charts	Digital Charts	1952-1977	Arctic Antarctic NZ	Navocean DNOM	8K Obs

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UNANNOUNCED	<input type="checkbox"/>
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Data File Summary

Minor Holdings

TITLE	TOTALS	FORMAT	PERIOD	COVERAGE	SOURCE	BACKLOG
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BIOLOGICAL DATA

Bioluminescence	57K Reports	Microfiche File Cards	1940-1977	Worldwide	Literature Publications	None
Biotransect	63 Trans.	Tabulations	1970-1975	Bahamas Hawaii	Navocean Surveys	23 Trans
Bioquadrat	63 Quad	Charts	1968-1976	Bahamas Hawaii, Guam	Navocean Surveys	4 Quad
Dangerous Marine Animals	28K Reports	Microfiche File Cards	1940-1977	Worldwide	Literature Publications	None
Discolored Water	10K Reports	Microfiche File Cards	1930-1977	Worldwide	Literature Publications	None
Fouling	18.8K Ref.	Microfiche File Cards	1930-1976	Worldwide	Literature Publications	500 Articles
Fouling Panel	62 Sta.	Samples Reports	1960-1977	U.S. Foreign Harbors	Navocean Surveys	75 Samples
Plankton	16K Reports	Microfiche Articles	1940-1977	Worldwide	Literature Publications	None

GEOPHYSICAL/GEOLOGICAL DATA

Bathymetric Charts	11K Charts	Charts	1950-1975	Worldwide	National International	None
Beach Elevation Profile	584 Profiles	Graphs	1966-1975	Bahamas Hawaii	Navocean Surveys	12 Profiles
Photography Bottom	125K Photos	35mm Film	1950-1975	Worldwide	Navocean Institution Surveys	40K Photos
Photographs Coastal	126 Runs	35mm B&W Strip Film	1970-1976	U.S. Coasts	Navocean Surveys	None
Photography Shallow Water	10.1K Photos	Prints, Slides, Negatives	1968-1976	Bahamas, Hawaii, Guam	Navocean Surveys	None
Photography Cine	50K Feet	16mm Color Movie Film	1967-1974	Bahamas, Hawaii, Vieques	Navocean Surveys	None
Side Scan Sonar	1.7K Miles	Sonargrams	1970-1976	U.S. Coasts	Navocean Surveys	None

PHYSICAL DATA

Climatology - SST, Waves	17.8M Obs	Digital Compressed	1850-1969	Worldwide	National International Cruises	None
Current Subsurface	4.0K Ref.	File Cards Articles	1850-1977	Worldwide	Cruise Rpts Journals Publications	None
Light Transmission	1.1K Sta.	Data Sheets Notations	1970-1976	Harbor Approaches	Navocean Surveys	123 Sta.

NAVOCEANO DATA FILE SUMMARY

CODE: 3440

DATE January 1977

TITLE: BOTTOM LOSS/PROPAGATION LOSS, PEAK ANALYSIS

DESCRIPTION OF DATA: Station files formatted to report Bottom Loss and Total Loss Computed from peak analysis at seven frequencies of Broad Band Analog Tapes Recording the received levels of detonations of SUS charges dropped at scheduled intervals along a shooting track. Range separation of each shot and the receiver were measured with a Hastings Raydist. Each station reports shot number, range, grazing angle, and Bottom Loss/Total Loss at each of 7 frequencies for each shot. Peak analysis is based on the singly reflected bottom arrival only from near normal incidence to approximately 5° depending on ray theory limitations and operating depths.

DATA FORMAT: All station files are in NAVDAB format on Digital Magnetic Tape in the BRACED Bank (an unofficial NAVDAB Bank). This bank may be queried for any single (or any multiple combination of) constraint, parameter, and/or variable reported in a station file.

UNITS: All values are stored internally in NAVDAB in metric units, but output may be requested in any convertible units desired.

ACCURACY/PRECISION: ± 0.2 dB

SAMPLING INTERVAL: Variable

EXTENT OF COVERAGE: 1,570 stations

PERIOD OF COVERAGE: 1966-1974

REPOSITORY: Magnetic Tape Library, Code 5400

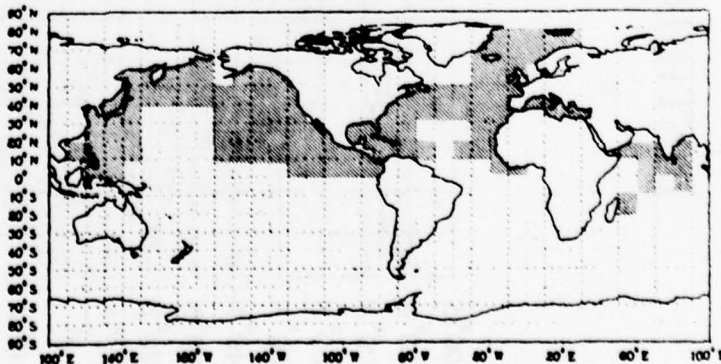
AREA OF COVERAGE: Worldwide

CUSTODIAN: *Roger Merryfield (601) 688-4308*
~~J. Cole (202) 433-2735~~

BACKLOG:

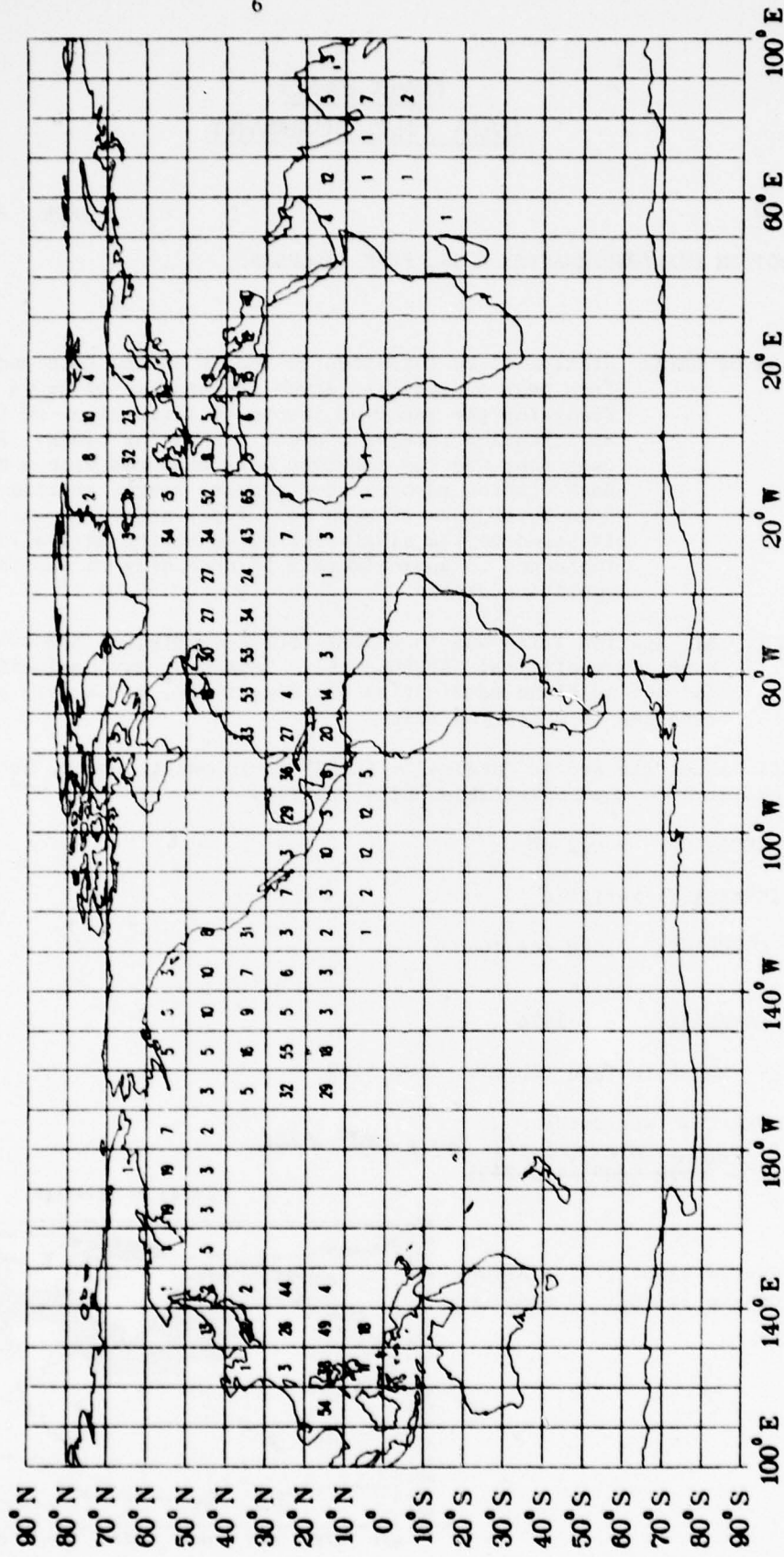
Cruise 930007, 37 stations
Cruise 343407, 7 stations

Area of Coverage



DISTRIBUTION OF BOTTOM LOSS/TOTAL LOSS (PEAK)

By 10 Degree Squares
(1,570 Stations)



AS OF JANUARY 1977

BOTTOM LOSS/PROPAGATION LOSS

INTRODUCTION

The Naval Oceanographic Office (NAVOCEANO) has conducted acoustic survey operations at 1,570 stations in nearly all of the oceans and major seas of the Northern Hemisphere. The purpose of the surveys is to provide data to adequately describe the acoustic/environmental conditions in support of the Navy's mobile/fixed sonar systems. Specifically, bottom loss data obtained on these surveys are directly used to aid the ASW/USW forces in solving the bottom loss term of the sonar equation. Bottom loss, defined as acoustic energy lost to the sea floor, is dependent on frequency, bottom grazing angle, bottom roughness, and type of bottom sediment. Bottom loss/propagation loss surveys began in 1965 with the Marine Geophysical Survey (MGS) Project, which was performed by private industry under contract to NAVOCEANO. In 1968, the effort was transferred to the ASW/USW Survey Project at NAVOCEANO.

DATA COLLECTION SYSTEMS

Shipboard acoustic surveys are conducted aboard the AGS-class and AGOR-class ships. One of the major purposes of the surveys is to make quantitative measurements of bottom loss as a function of grazing angle and total propagation loss as a function of horizontal range. Two ships are required to obtain these measurements. Typically an AGS ship is outfitted as the receiving ship and an AGOR ship is outfitted as the shooting ship. The receiving ship remains stationary while the shooting ship proceeds along a designated shooting course, dropping about 50 MK-61 SUS sound sources at selected intervals, out to a horizontal range of approximately 30 miles. The bottom-returned signal is received by a hydrophone (suspended from the receiving ship), amplified, and recorded broadband on a magnetic tape recorder. Ship-to-ship ranges are monitored during each run, and the bottom loss system is calibrated before and after each station. Sound velocity, bathymetric, and sub-bottom profiles are collected along the acoustic shot runs to aid in later data analysis.

In addition to standard two-ship surveys, surveys using a single ship have been conducted more recently. One method involves a recoverable buoy with an internal tape recorder to replace the receiving ship. A second method uses modified, expendable sonobuoys instead of a receiving ship. In this system, the acoustic data are transmitted to the shooting ship through an rf link.

Airborne acoustic surveys using NAVOCEANO's VXX-8 and Fleet aircraft have become the most important source of bottom loss data. Survey operations are similar to operations on board ship except that an expendable, modified AN/SSQ-57A sonobuoy replaces the shipboard hydrophone. The MK-61 SUS charges are dropped from the aircraft. The advantages of airborne surveys are: (1) a faster data acquisition rate and (2) a considerably lower cost per data point. The disadvantages of airborne surveys compared to shipboard surveys are: (1) water sound

speeds need to be calculated from XBT data, (2) bathymetric and sub-bottom profiles are not obtained along the shooting track, and (3) distances between the charge and sonobuoy are less accurately obtained.

DATA REDUCTION AND FILES

Survey Data Reduction. Bottom loss data are computed using the following equation:

$$BL = SL - RL - PL$$

where:

BL = Bottom loss in dB

SL = Source level in dB

RL = Received level in dB, and

PL = Propagation loss in the water in dB

As a check on the receiving system, values of source levels (SL) are measured independently and compared to historical values. Received levels (RL) for a given frequency are calculated by algebraically summing the hydrophone or sonobuoy sensitivity level, gain level, and recorded level of the bottom return. The actual input to the bottom loss computer program includes values of source level, component values of received level, source depth, receiver depth, water depth, horizontal range, and values of sound speed as a function of water depth. Frequency-dependent direct path propagation loss vs horizontal range is also measured utilizing source level, received level, hydrophone sensitivity, and gain level values.

Output from the program includes tables and plots of bottom loss versus grazing angle and total propagation loss vs horizontal range for various frequencies and bandwidths. Values of bottom loss and propagation loss for each station are stored on magnetic tape or disk.

Data collected during the MGS surveys and several of the subsequent ASW/USW cruises, representing a combined total of approximately 1600 stations, were reduced and reported in terms of the peak amplitude of the first bottom arrival. Values were reported normally for the 1/3-octave bands centered at 100, 500, 1000, 2000, 3500, 6000, 8000 and 12000 Hz, plus a sonar simulator frequency. Not all frequencies were reported at each station; 100-Hz data are sparse, and frequencies above 3500 Hz were range-limited due to absorption.

Cruises subsequent to FY 74, representing approximately 475 stations, have been or are being reduced and reported in terms of the total energy in the first set of bottom arrivals. Values are reported at the center frequency of consecutive 1/3-octave bands starting at 10 Hz to about 3500 Hz, plus the sonar simulator frequency. The total energy reduction is accomplished by displaying, inspecting, and selectively digitizing the broadband signal and inserting the digitized signal into a Hewlett-Packard Model 5451B Fast Fourier Transform Analyzer.

Data Reduction Facilities. A hard-wired FFT (Fast Fourier Transform) analyzer is used to convert analog time-domain data to digital frequency-domain data. The computed values of total energy bottom loss vs frequency are stored on disk with an optional tape output. New software is continually being developed to satisfy new requirements or improve flexibility and efficiency. An applications package that will incorporate RAYWAVE II, FACT, and sound velocity profile averaging has recently been completed.

Data Banks. NAVOCEANO maintains master files of processed digital bottom loss/propagation loss data collected by the Marine Geophysical Survey and ASW/USW Surveys. Approximately 1,570 stations are contained in these master files. Most of these stations include data between 200 Hz and 5 kHz. More recent data include analyses between 30 Hz and 3.5 kHz. Currently the master files containing MGS and more recent bottom loss data are being reprogrammed so that they can be included in the NAVDAB Data Bank.

Reprocessing. As the need for bottom loss data at lower frequencies (< 200 Hz) has increased, techniques for reprocessing the worldwide MGS data have been investigated. Also, 63 stations have been reprocessed using total energy processing in place of the earlier peak reprocessing at lower frequencies is anticipated. reprocessing at lower frequencies is anticipated.

Data Analysis. Bottom loss results from the various stations are compared. Stations which display similar results are grouped and average curves of bottom loss vs grazing angle are plotted. Various statistical programs are available to provide a polynomial fit to a given set of data. A program is also available for grouping the bottom loss data in selected grazing angle bands and for providing plots of the resultant means and standard deviations. Bottom loss province charts are constructed by ranking individual stations according to the magnitude of bottom loss. The locations of similarly ranked stations are noted and province boundaries are drawn. The province boundaries, in general, are related to the depth and physical makeup of the sea floor.

APPLICATIONS

Models. NAVOCEANO has developed a set of bottom loss curves that have been adopted as the "Navy Interim Standard" for use throughout the Fleet. The nine standard bottom loss curves, applicable to frequencies between 1.0 kHz and 3.5 kHz, are related to mappable ocean areas of similar physiography and bottom sediment type. Personnel within the Office are currently working with bottom loss results at frequencies below 1.0 kHz. A recent major finding discloses that a significant amount of low-frequency (100 Hz) acoustic energy is propagated along shallow refracted paths through the unconsolidated sediments of the sea floor. Therefore, it appears that two curves may be relevant in the frequency range between 30 and 300 Hz; one for ocean floor areas containing thick layers (> 100 meters) of unconsolidated sediments and the other for ocean floor areas containing thin

layers (< 100 meters) of unconsolidated sediments.

World Charting. Bottom loss data are used primarily to provide bottom loss province charts of the world oceans. High frequency (1.0 to 3.5 kHz) bottom loss charts have been constructed for oceans and adjacent seas of the northern hemisphere. These charts are particularly useful to active sonars, such as the AN/SQS-26, to show ocean areas where effective bottom-bounce operations can be conducted. The high frequency bottom loss province charts also serve as a base to the ASW Prediction Area Charts. These charts, produced by NAVOCEANO, display individual areas of similar bottom loss characteristics, similar water mass characteristics, and similar water depths.

Plans for the Future. NAVOCEANO will continue its efforts to improve response time to new, and continually broadening requirements, and to reduce turnaround time between collection and reporting. Increased emphasis will be placed on airborne collection of data because of cost effectiveness and time savings. Efforts will be directed toward refinement of the single-ship technique for data collection and greatly expanded data coverage in priority areas of the Indian Ocean, where existing data are sparse. Utilization of expanded FFT processing techniques also will be emphasized.

NAVOCEANO
DATA FILE SUMMARY

CODE 3443

DATE January 1977

TITLE: VOLUME REVERBERATION (Fixed-frequency)

DESCRIPTION OF DATA: Scattering intensity vs depth at 50 kHz. Data collected using two fixed-frequency transducers. Weather information and sea surface conditions recorded concurrently.

DATA FORMAT: Volume reverberation data and depth information recorded on analog magnetic tape; weather information and sea surface conditions recorded on appropriate log sheets.

UNITS: Scattering intensity in decibels; depth in meters.

ACCURACY/PRECISION: ± 0.5 dB/ ± 0.1 dB scattering strength; $\pm 0.1/\pm 0.001$ meters depth.

SAMPLING INTERVAL: 10 to 20 data points at each depth sampled; sampling depths: 0 to 500 meters at about 100-meter intervals.

EXTENT OF COVERAGE: 99 observations.

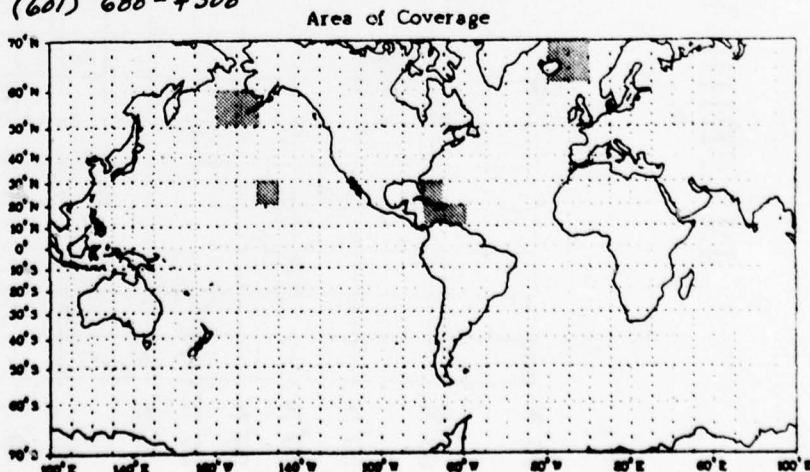
PERIOD OF COVERAGE: June 1975 - Dec 1976.

REPOSITORY: Code 3442

AREA OF COVERAGE: Northern Hemisphere.

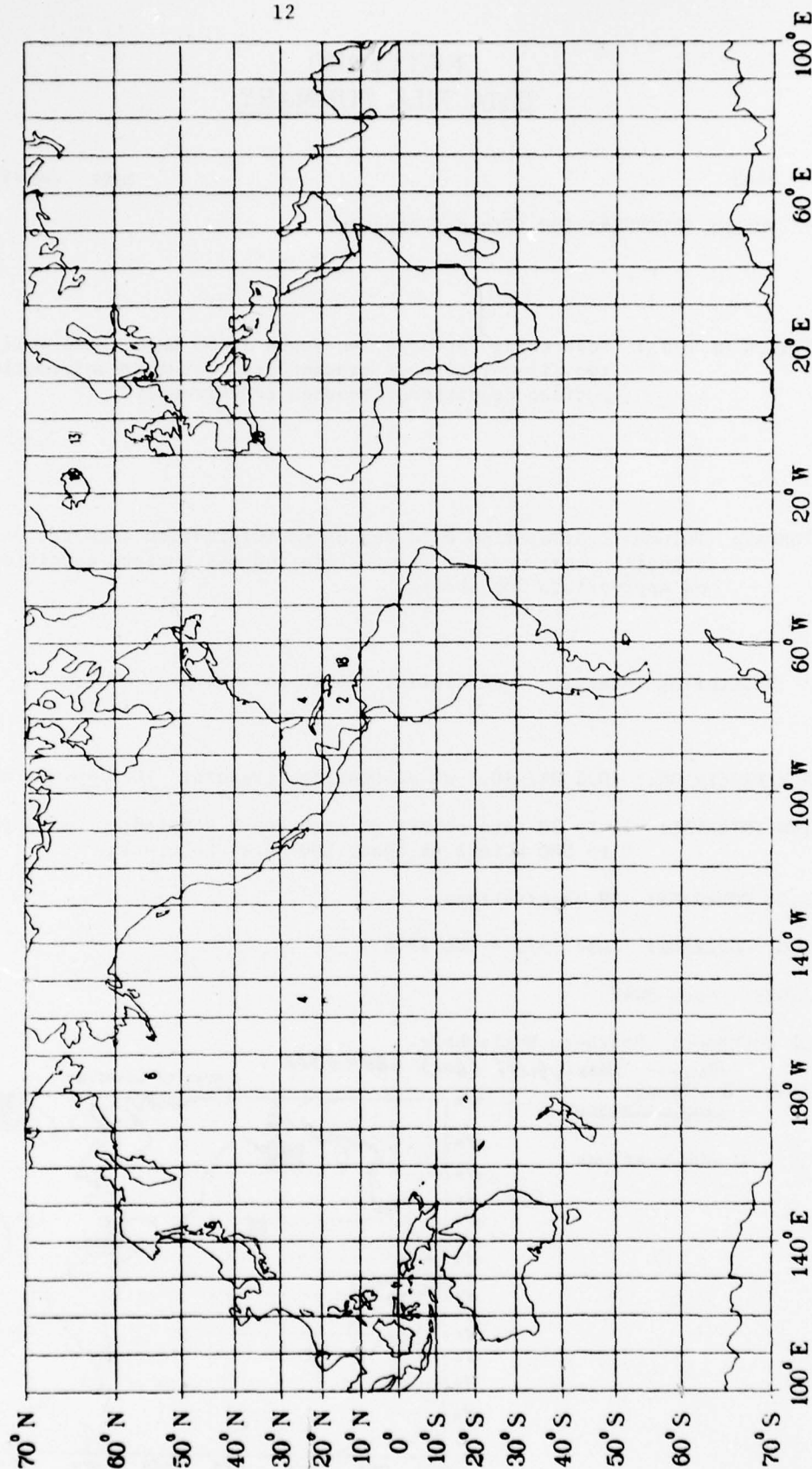
CUSTODIAN: *Roger Merryfield (601) 688-4308*
~~L. Franc~~
~~(202) 433-3994~~

BACKLOG: 91 observations



DISTRIBUTION OF VOLUME REVERBERATION DATA

By 10 Degree Squares
(99 Observations)



AS OF JANUARY 1977

VOLUME REVERBERATION

INTRODUCTION

The Naval Oceanographic Office has collected volume reverberation data at more than 300 locations in deep ocean basins and in straits, and the program is continuing. Quantitative measurements are made of volume scattering strengths as a function of frequency, time of day, depth, season, and geographic area. Most lower frequency (below 20 kHz) measurements are in the open ocean, and higher frequency measurements are in the straits and choke points. The main purpose of the data collection program is to provide environmental information that serves in the design, construction, and deployment of ASW weapons systems, particularly active sonars. Low-frequency volume reverberation measurements were made in a few selected areas during the Marine Geophysical Survey Project (MGS), 1965-1968, which was performed by private industry under contract to NAVOCEANO. April 1968 marked the beginning of NAVOCEANO's in-house effort, and the initial survey was conducted in the East China Sea. The collection of high-frequency volume reverberation data began in June 1975 in the areas between Iceland and the Faeroe Islands.

DATA COLLECTION

NAVOCEANO uses two kinds of sound sources to make volume reverberation measurements. Explosives (MK-61 SUS charges) are used to obtain data at frequencies below 20 kHz, and fixed-frequency transducers are used for making higher frequency measurements. More than 200 observations were made using MK-61 SUS charges, and about 100 observations were made with fixed-frequency transducers.

Low-frequency shipboard data collection techniques use MK-61 SUS charges as sound sources. The SUS charge, which contains 1.8 lbs. of TNT, is pressure-detonated at 60 feet. The charge is dropped near a hydrophone but far enough away to keep the signal from overloading the preamplifiers. To minimize ship self-noise, the hydrophone is suspended at a depth of 60 feet from a float approximately 250 feet from the ship. Reverberation from the explosive signal is picked up by the hydrophone and recorded broadband on analog magnetic tape. The recorded signal is then played back, processed through a filter/analyzer system, and scattering strength (plus a calibration value that must be subtracted) is printed out on a digital printer.

The method presently being used for acquisition of volume reverberation data at frequencies above 20 kHz employs the use of two transducers of the same frequency mounted so that one "looks" up and the other "looks" down. Manually pulsed CW signals are emitted after the transducers are winched to preselected depths. Measurements are made above, below, and in the deep scattering layer (DSL). The transducer method permits the acquisition of data that describe the vertical reverberation structure of the water column.

Volume reverberation measurements are also made from an aircraft. Using MK-61 SUS charges set for 60-foot detonation, and modified AN/SSQ-57A sonobuoys with a 60-foot hydrophone cable, the acoustic signal is transmitted to the circling aircraft and recorded broadband on magnetic tape. Except for a few random samples that are worked on in the field, the data are reduced and processed at NAVOCEANO.

DATA REDUCTION

The techniques and methods used to process volume reverberation data obtained by using SUS charges include a multifilter and an RMS detector that is capable of sampling up to 30 analog signals simultaneously. The measurements are then automatically converted to dB and printed out in digital form. The final results are volume scattering strengths at 1/3-octave bandwidths over a frequency range of 500 Hz to 20 kHz.

To process fixed-frequency transducer data, the analog magnetic tape containing the raw data is played back into a Fast Fourier Transform analyzing system. The software program is structured to yield scattering vs depth for each of the two transducers. Efforts are underway to develop programs that will produce statistical analyses and plots of the results showing the minimum, mean, and maximum volume scattering intensity at 50 kHz as a function of depth.

RESULTS AND APPLICATIONS

NAVOCEANO's volume reverberation measurements program is configured to support both mobile and fixed weapons systems requirements. Environmental information is reported in the formats and types required by the user.

The various basic sonar equations are written at the 50-percent level of detection probability, the point at which the sonar is just performing its function. In the case of active sonar, the reverberation level term of the equation is often critical; if levels are high enough, the system becomes reverberation limited.

Scattering, or volume reverberation levels vary with frequency, depth, time of day, season, and geographic area. Survey efforts to delineate all of the variable features of volume reverberation on a worldwide basis would involve a long-term effort; however, by relating volume reverberation measurements to biological and oceanographic conditions, it is possible to predict seasonal, diurnal, and depth variations in levels for the various sonar systems. Preliminary charts of volume reverberation levels have been produced at NAVOCEANO for the North Atlantic Ocean on this basis. With increased holdings of volume reverberation data in this and other oceans, these charts can be updated and expanded to include the additional areal coverage.

PLANS FOR FUTURE

An improved shipboard method of explosive source data collection is the use of 1/2-pound blocks of TNT. While the ship drifts on station, the TNT is allowed to float away from it and toward an omnidirectional hydrophone suspended about 30 feet below the sea surface. This surface-explosion method eliminates the gas "bubble" formed by an underwater explosion by causing the gas to be vented to the air.

Funds have been committed for procurement of an underwater signal receiving array. The array is wideband and directional and consists of a 30-element line transducer mounted axially in a 48-inch long, 72-inch diameter metal cone. The array, together with the surface-vented method of producing an acoustic signal, will permit the acquisition of broadband profiles of volume reverberation strength vs depth, to depths below 300 meters.

Efforts are presently being made to develop the hardware and techniques to make volume reverberation measurements from a moving ship. The method utilizes a high-frequency transducer as a sound source, and thus has direct applicability to the types of information required for the NAVOCEANO survey program.

Future plans for data collection, analysis, and modeling are based on the assumption that a properly selected set of samples will provide the data necessary to define the diurnal, seasonal, and depth variability of volume reverberation in identifiable provinces of the world's oceans.

NAVOCEANO DATA FILE SUMMARY

CODE: 3442

TITLE: AMBIENT NOISE

DATE January 1977

DESCRIPTION OF DATA: Ambient noise level vs frequency. Horizontal directivity measurements made by deploying a number of sonobuoys in a predetermined pattern or field. Vertical dependence of ambient noise determined by simultaneous recording of three sonobuoys deployed at available standard hydrophone depths (19, 91, 301 meters). Weather information and sea surface conditions recorded concurrently.

DATA FORMAT: Ambient noise data recorded on analog magnetic tape; weather information and sea surface conditions recorded on appropriate log sheets.

UNITS: Ambient noise level in decibels.

ACCURACY/PRECISION: ± 3 dB/ ± 3 dB.

SAMPLING INTERVAL: Continuous for up to 8 hours at one or all of three depths (19, 91, 301 meters).

EXTENT OF COVERAGE 397 Observations

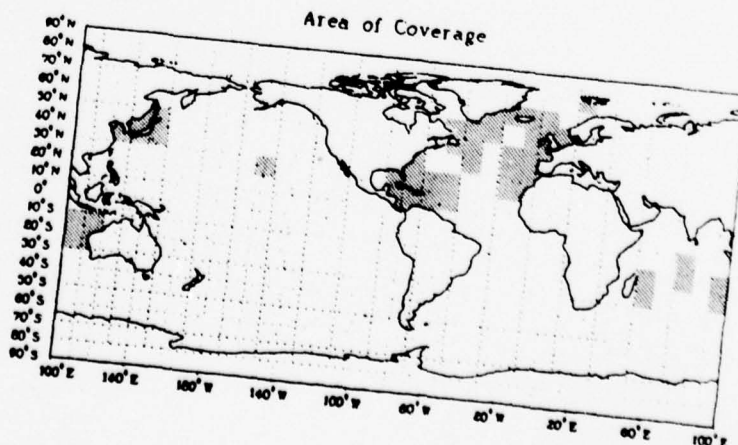
PERIOD OF COVERAGE: Jun 1971 - Dec 1976

REPOSITORY: Code 3442

AREA OF COVERAGE: Worldwide

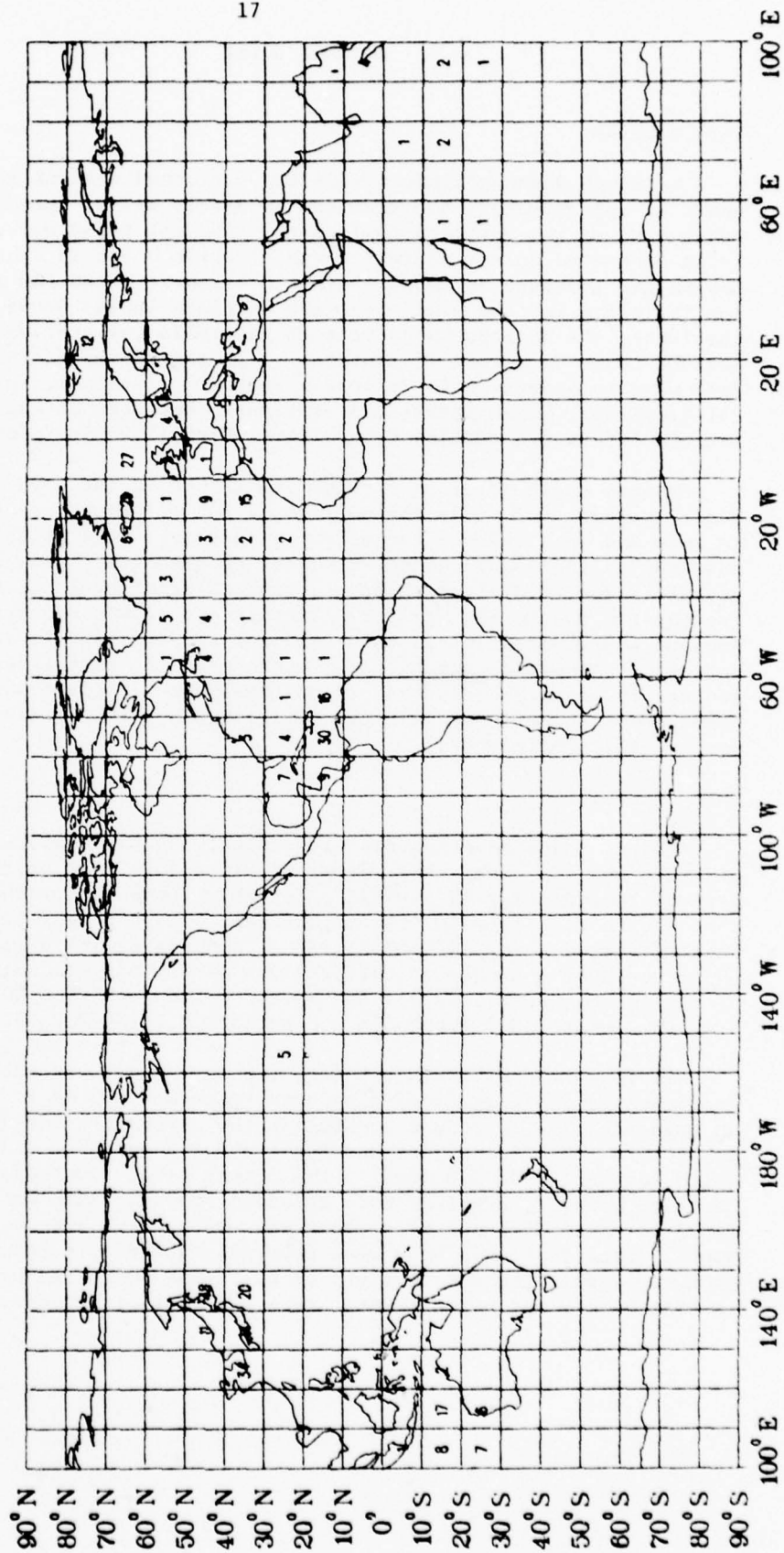
CUSTODIAN: *Roger Merryfield (601) 688-4308*
~~L. Franc (202) 433-3994~~

BACKLOG: 227 Observations



DISTRIBUTION OF AMBIENT NOISE DATA

By 10 Degree Squares
(397 Observations)



AMBIENT NOISE

INTRODUCTION

The Naval Oceanographic Office has conducted ambient noise measurements at approximately 400 stations in nearly all of the oceans and major seas of the northern hemisphere. Ambient noise surveys were first conducted in the eastern North Atlantic Ocean in June, 1971. Geographic coverage includes the North Atlantic Ocean (88 stations), the Caribbean Sea (64 stations), the northern Indian Ocean (10 stations), the Wharton Basin west of Australia (44 stations), and the BARSTUR range in Hawaii (5 stations). In the survey of Pacific straits, data were collected in La Perouse Strait (29 stations), Unimak Pass (31 stations), Umnak Strait (35 stations), Amchitka Strait (37 stations), Tsugaru Strait (24 stations), and Korea Strait (45 Stations).

Ambient noise is of particular importance to the Navy's passive sonar systems, for it is the background out of which detections must be made and into which a target may disappear. High noise levels observed in the sound channel at lower frequencies (below 500 Hz) are primarily due to distant shipping, whereas high levels at the higher frequencies (above 500 Hz) are primarily due to wind-generated noise. Ambient noise directivity, both vertical and horizontal, is also variable. Acoustic data holdings currently are insufficient to adequately model ambient noise conditions for any given locale. NAVOCEANO's acoustic surveys are designed, in part, to assist in meeting this deficiency.

DATA COLLECTION

Ambient noise measurements are conducted aboard NAVOCEANO's P3A aircraft and, in some cases, Fleet P3 aircraft. Most of the data were collected using AN/SSQ-57A expendable sonobuoys, with a hydrophone depth of either 60 feet or 300 feet. More recently, data have been collected using AN/SSQ-57A (XN-5) sonobuoys with a fixed hydrophone depth of 1000 feet. Calibrations on all 57A sonobuoys are performed at the factory and are spot-checked at NAVOCEANO. Calibrations on all XN-5 sonobuoys are performed at NAVOCEANO.

All measurements are short-term (up to 8 hours, or the life of the sonobuoys) and are recorded broadband (generally 10 Hz to 5000 Hz) on magnetic tape recorders located in the aircraft. Earlier measurements were taken using just one sonobuoy at a location and at a single depth (either 60 or 300 feet). The recent straits surveys in the Pacific, however, required more detailed acoustic information, and a field of up to 50 buoys were monitored over a time interval of a few hours. Data from each buoy were recorded on a single channel of magnetic tape. The entire field of buoys was monitored by recording in time blocks and using several tape recorders in tandem.

The horizontal directivity of ambient noise in the area was obtained by using this measurement technique. By the simultaneous recording of three sonobuoys deployed at available standard hydrophone depths (60, 300, and 1000 feet) some measurements of the vertical dependence of ambient noise have been made.

DATA REDUCTION

Magnetic tapes containing ambient noise data are processed at NAVOCEANO. A General Radio 1921 Real-time Analyzer, consisting of a multichannel RMS detector and a 1/3-octave bandwidth filter set, is used to process the data. Typically, an integration time of 32 seconds is used to obtain a sample for each minute of recording and for each of 25 continuous 1/3-octave bands between 12.5 Hz and 3150 Hz. Spectrum levels of the 25 center frequencies for each minute sample are obtained by applying calibration and correction factors and processing on a PDP-9 computer.

APPLICATIONS

Depending on local shipping observed from the aircraft, data may be combined to give means and standard deviations of ambient noise over longer periods of time.

If local shipping is in the area, a time-series at a single frequency is often made to determine times of least-contaminated noise conditions or, in some instances, maximum noise conditions. In the latter case, data may be further processed to produce narrow band information over a limited frequency range in order to observe line components of the noise source. Using Fast Fourier Transform (FFT) processing techniques, NAVOCEANO data are now being processed for 1-Hz bandwidths at frequencies between 10 Hz and 500 Hz.

From data collected during the straits surveys, the least-contaminated noise levels from all the buoys in the field are plotted on a chart, and equal-noise-level contours are drawn. The resultant ambient noise contour chart shows the spatial variation and horizontal directivity of the ambient noise field. This can be a very useful tool to Fleet personnel given the mission of monitoring a strait or other "choke" point. The chart can aid in the determination of the most advantageous positioning of a passive sonar system.

PLANS FOR FUTURE

Surveys. Surveys planned for the immediate future are short-term ambient noise measurements in the Mediterranean Sea and long-term ambient noise measurements in the Central Pacific Ocean. The latter survey will include a deepwater vertical array attached to a moored buoy. This 1500-meter array consists of 12 hydrophones; the signal from each phone is recorded on a separate channel of a tape recorder located in the instrument pressure vessel (IPV) of the buoy.

Depending on the selected sample length and sample interval, it will be possible to obtain ambient noise measurements over a period of several months.

Data Reduction. Improved techniques for faster processing of acoustic data are being developed by NAVOCEANO. The hard-wired FFT will readily convert analog data to digital data and will virtually eliminate hand processing of ambient noise data. The incorporation of the FFT system will also give an in-house capability of performing narrow-band processing of ambient noise data.

NAVOCEANO
DATA FILE SUMMARY

CODE: 34213

DATE *October 1978*
~~January 1977~~

TITLE: BIOLUMINESCENCE

DESCRIPTION OF DATA: Bioluminescent display reports, containing date, location, sea and meteorological conditions, ship traffic and duration of phenomenon.

DATA FORMAT: Retrievable bibliographic references and articles on 3- X 5- and 5- X 8-inch reference cards and microfiche.

UNITS: Not applicable

ACCURACY/PRECISION: Not applicable

SAMPLING INTERVAL: Various.

EXTENT OF COVERAGE: 5,732 Reports

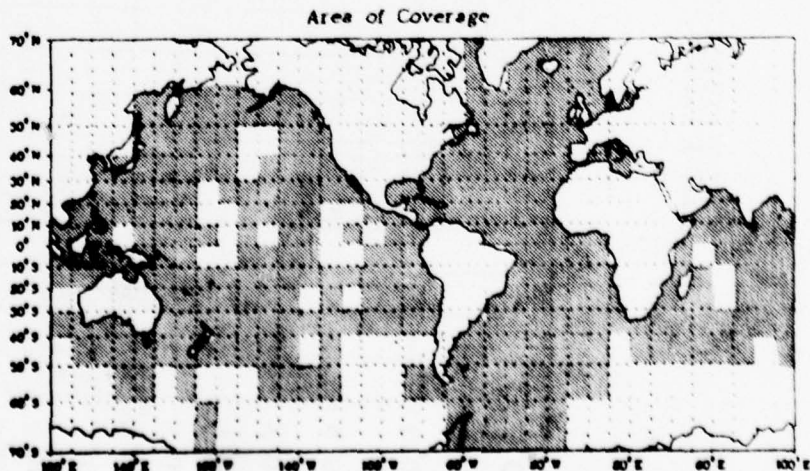
PERIOD OF COVERAGE: 1940-1977

REPOSITORY: *Biology*
~~Biological Data~~ Section (Code 34213)

AREA OF COVERAGE: Worldwide

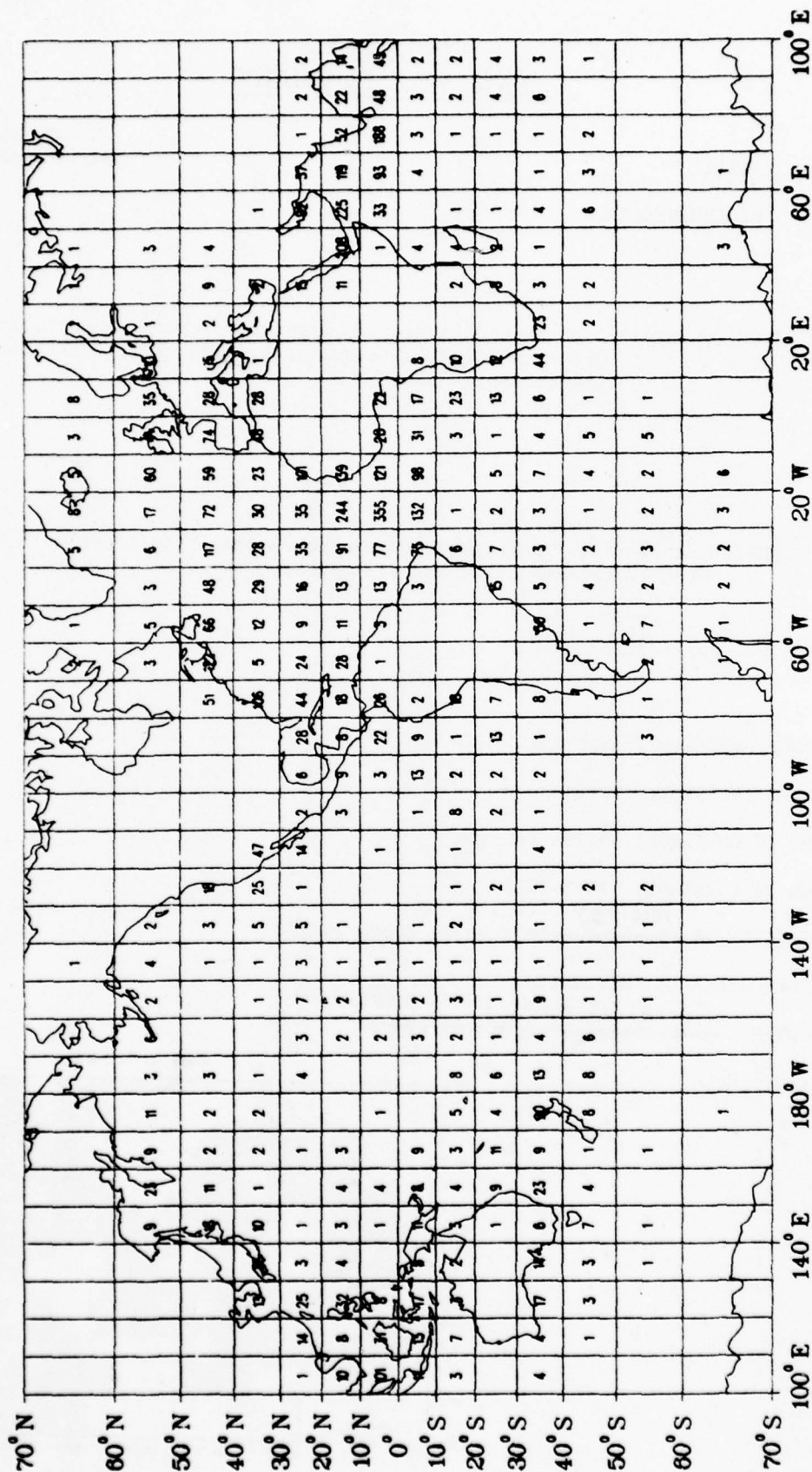
CUSTODIAN: *Adron F. Hall (601) 688-4110*
~~R. F. Staples (202) 433-1022~~

BACKLOG: None



DISTRIBUTION OF BIOLUMINESCENCE REPORTS

By 10 Degree Squares
(5,732 Reports)



OCTOBER 1972
AS OF JANUARY 1977

BIOLUMINESCENCE

INTRODUCTION

The bioluminescence data file consists of 5,732 reports. Of these, 2,780 are filed by area, 1,430 are filed by subject/author/title, and 840 references are in the microfiche system. In addition, there are 629 abstracts and summaries on 5- X 8-in cards.

DATA COLLECTION SYSTEM

Literature survey.

DATA SCOPE AND FILE CHARACTERISTICS

Data include areal treatments, fauna, naturalist and mariner reports, and general species biology. The data are in observational reports which vary in journalistic style. The location and description of the observed phenomenon are usually reported by: Date, location, sea or meteorological conditions, ship traffic, and duration of phenomenon. Data are from nearly every body of water and from nearly every depth range. The majority of the useful data can be retrieved from the microfiche file in under 2 minutes. Access is by geographic area, author/title/subject, and type.

APPLICATION

Data retrieval is for the purpose of area and special request studies, as well as intelligence documents.

PLANS FOR THE FUTURE

This file is rapidly being expanded since a new ASW nonacoustic effort is under way.

NAVOCEANO
DATA FILE SUMMARY

CODE: ~~34222~~ **34213**
TITLE: BIOQUADRAT

DATE ~~January 1977~~ **October 1978**

DESCRIPTION OF DATA: Charts of the distribution of benthic organisms (corals, sponges, etc.) in 10-meter or 5-meter squares.

DATA FORMAT: Publications

UNITS: Not applicable.

ACCURACY/PRECISION: Not applicable.

SAMPLING INTERVAL: 5 or 10 meter squares

EXTENT OF COVERAGE: ~~37~~ **42** Quadrats

PERIOD OF COVERAGE: 1968 - ~~1976~~ **1978**

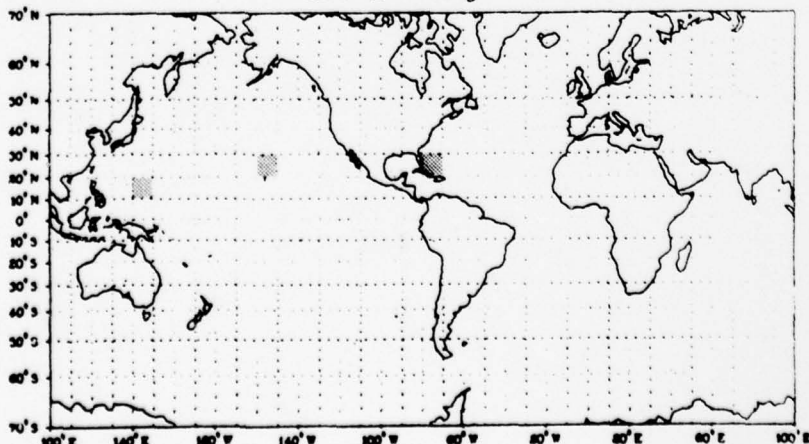
REPOSITORY: Code ~~34222~~ **34213**

AREA OF COVERAGE: Bahamas, Hawaii, Guam

CUSTODIAN: H. D. Huddell (AUTOVON) 485-4110

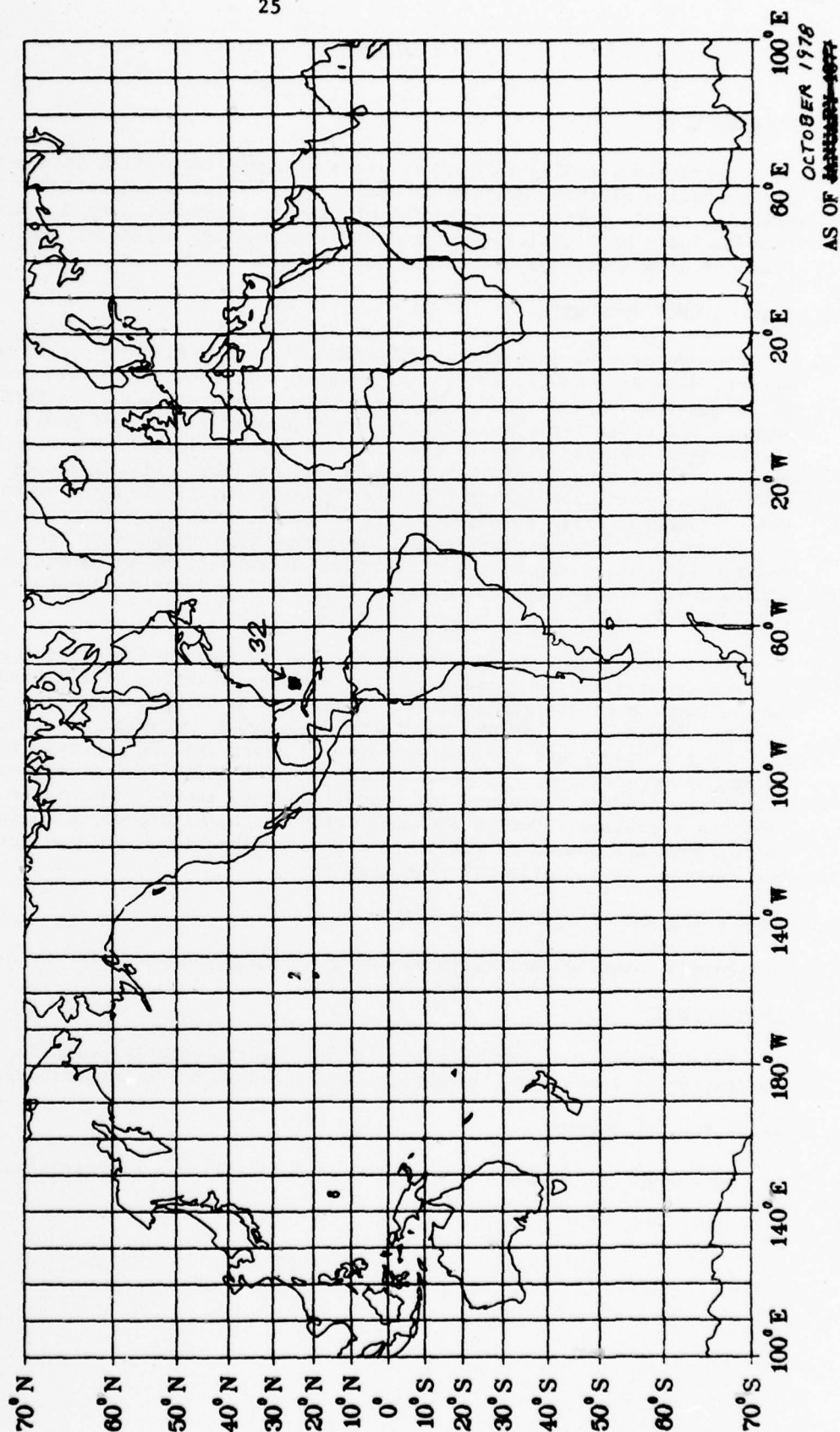
BACKLOG: 4 quadrats

Area of Coverage



DISTRIBUTION OF BIOQUADRAT DATA

By 10 Degree Squares
(37 Quadrats)



BIOQUADRAT

INTRODUCTION

Quadrats are ecological survey areas designed to provide detailed documentation of the condition of small areas of the ocean bottom. Quadrats enable periodic monitoring of benthic communities on a scale that includes both qualitative studies of individual organisms and statistical analyses of the entire community.

DATA COLLECTION SYSTEMS

Each quadrat as laid out by NAVOCEANO divers is either 5 or 10 meters square, depending on the density of organisms in each particular area, and is permanently marked at each corner with a concrete block. To facilitate mapping and photomosaic photography, each quadrat is divided into 9 squares formed by connecting wires to the concrete corner blocks. The wire grid remains only during diver sketching and photography. Divers sketch each quadrat, identifying and locating each visible sessile benthic organism. Using photogrammetric techniques, the entire quadrat is photographed and a photomosaic later constructed. The mosaic photographs are taken from about 6 feet above the bottom. Using an underwater, 35-mm camera equipped with a 21-mm lens, a bottom coverage of about 7 x 10 feet is obtained from each photograph.

After the sketching and photography are completed, the wires are removed leaving the concrete blocks to mark the location of the quadrat. As the purpose of the quadrats is to establish a permanent monitoring station, their locations are carefully documented. From the sketches made by the divers and the photomosaics, a chart showing species distribution is constructed. Close-up photographs of individual organisms within the quadrat are taken for comparison with future photographs of the same organisms. During the monitoring phase, prints of the original photographs are sealed in plastic and used by the divers in duplicating the coverage of the original photographs.

DATA SCOPE AND FILE CHARACTERISTICS

Quadrat sketches and photomosaics are catalogued and filed by area.

APPLICATIONS

Establishment and documentation of bioquadrats enable periodic monitoring of communities to determine changes in those communities.

PLANS FOR THE FUTURE

No changes in method of operation or data filing are anticipated.

NAVOCEANO
DATA FILE SUMMARY

CODE: ~~34222~~ ³⁴²¹³
TITLE: BIOTRANSECT

DATE ~~January 1977~~ ^{October 1978}

DESCRIPTION OF DATA: Tabulations of benthic organisms (corals, sponges, etc.) along a line transect.

DATA FORMAT: Numerical- and letter-coded tabulations; about 20 percent are computer formatted.

UNITS: Organism counts.

ACCURACY/PRECISION: Not applicable.

SAMPLING INTERVAL: Not applicable.

EXTENT OF COVERAGE: ⁷²~~63~~ Transects

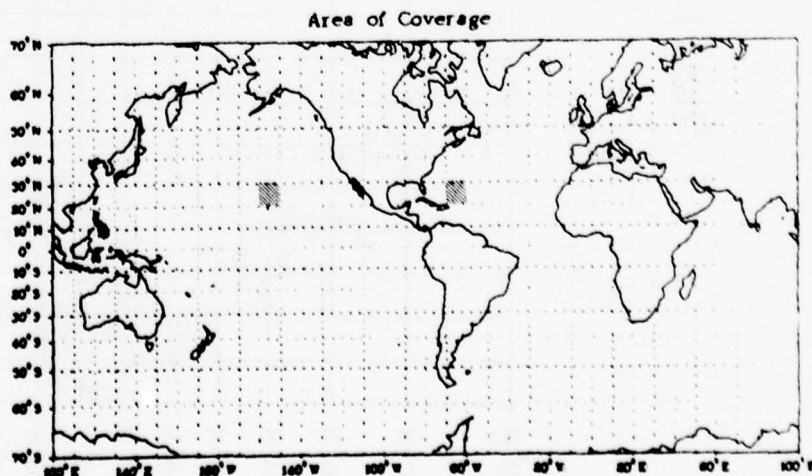
PERIOD OF COVERAGE: 1970 - ¹⁹⁷⁸~~1975~~

REPOSITORY: Code ³⁴²¹³~~34222~~

AREA OF COVERAGE: Bahamas, Hawaii

CUSTODIAN: H. D. Huddell (AUTOVON) 485-4110

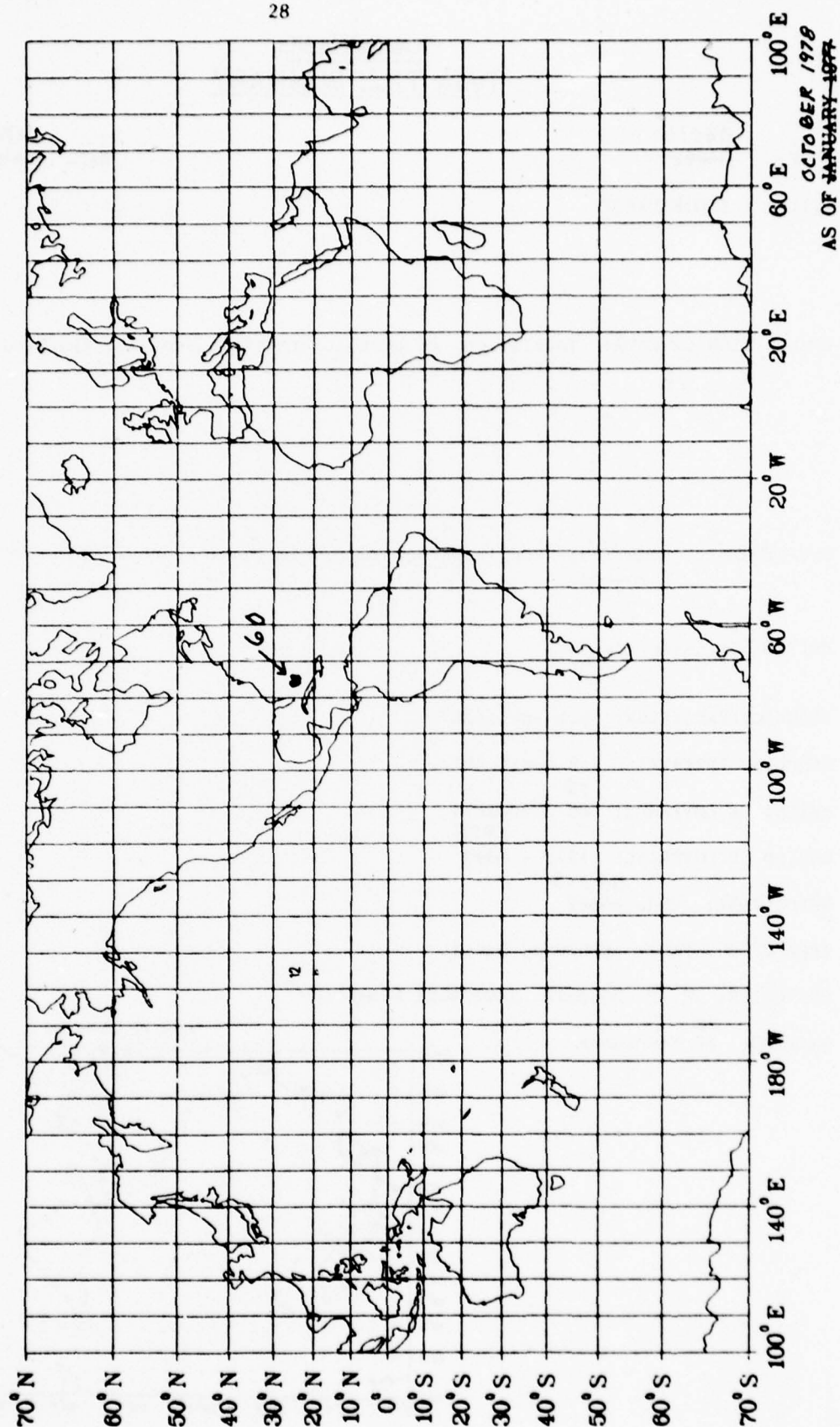
BACKLOG: ¹²~~23~~ transects



DISTRIBUTION OF BIOTRANSECT DATA

By 10 Degree Squares

(63 Transects)



BIOTRANSECT

INTRODUCTION

Biological transect data are taken to document quantitatively the extent and distribution of benthic organisms, particularly in coral reef areas.

DATA COLLECTION SYSTEMS

The transect method is used primarily on the reef front, where water depth restricts prolonged diver observations and hampers delineation of bottom features from aerial photographs. To the anchor of a surface buoy is attached one end of a ball of light cotton line. The anchor is dropped at a depth of about 70 feet on the reef front. The line is laid out by small boat toward the barrier reef to a depth of about 20 feet, where it is tied to the anchor of another surface buoy. Using a portable echo sounder, a depth profile is recorded for the area between the deep and shallow buoys. Divers then swim along the line, identifying and recording each sessile organism having its basal attachment either touching or beneath the line and taking photographs of representative organisms or groups of organisms. Concurrently, divers record depths and topographic features.

DATA SCOPE AND FILE CHARACTERISTICS

Transects are catalogued and filed by area.

APPLICATIONS

Documentation of the extent and distribution of benthic organisms.

PLANS FOR THE FUTURE

No changes in method of operation or data filing are anticipated.

NAVOCEANO
DATA FILE SUMMARY

CODE: 34213

DATE *October 1978*
~~January 1977~~

TITLE: DANGEROUS MARINE ANIMALS

DESCRIPTION OF DATA: Reports of human injuries from dangerous marine animals.
Microfiched articles and bibliographic references concerning dangerous marine animals.

DATA FORMAT: Retrievable bibliographic references and articles on 3- x 5- and
5- x 8-inch reference cards and microfiche.

UNITS: Not applicable

ACCURACY/PRECISION: Not applicable

SAMPLINE INTERVAL: Not applicable

EXTENT OF COVERAGE: 2,811 Injury Reports

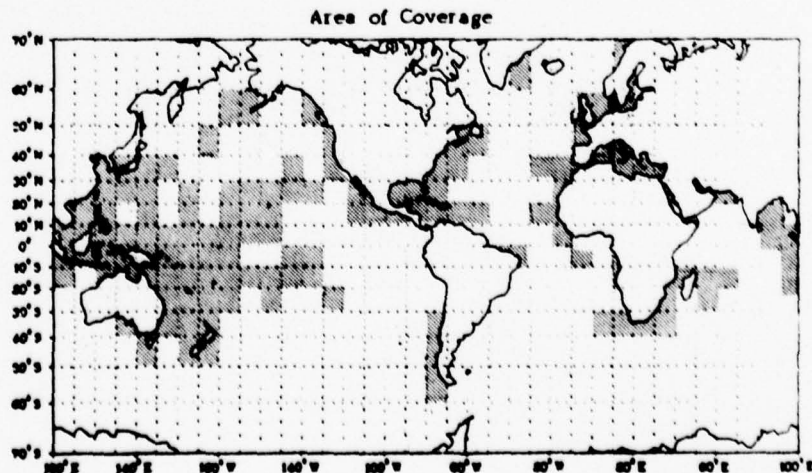
PERIOD OF COVERAGE: 1940-1977

REPOSITORY: *Biology*
~~Biological Data~~ Section (Code 34213)

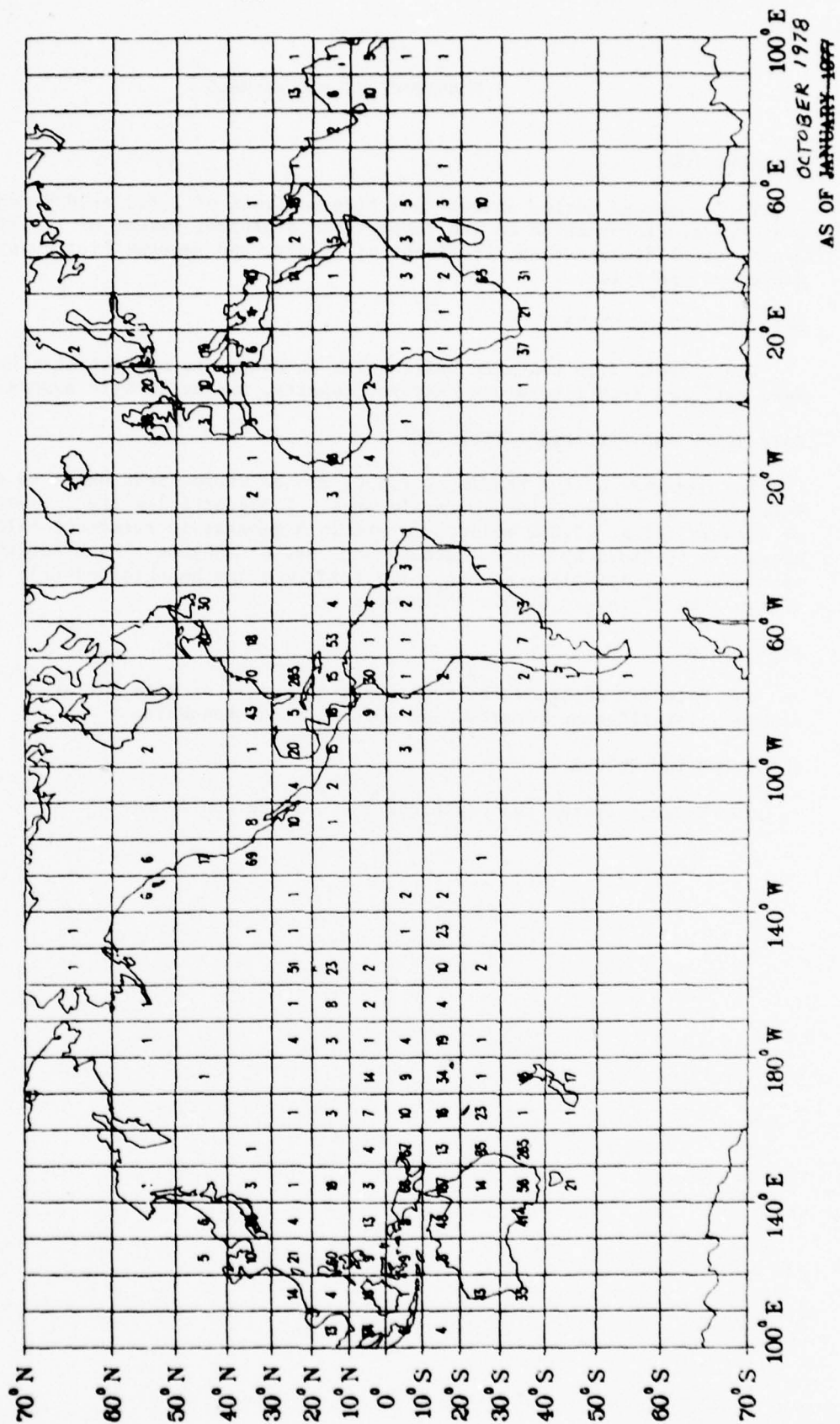
AREA OF COVERAGE: Worldwide

CUSTODIAN: *Samel A. Army (601) 688-4110*
~~R. F. Staples (202) 433-1022~~

BACKLOG: None



DISTRIBUTION OF REPORTS OF DANGEROUS MARINE ANIMALS By 10 Degree Squares (2,811 Injury Reports)



DANGEROUS MARINE ANIMALS

INTRODUCTION

The dangerous marine animal data file consists of 2,811 injury reports that contain information on the responsible organism, extent of injury or death, areal distribution, treatment of injury, and general biology of dangerous species.

DATA COLLECTION SYSTEM

The overall file contains information on dangerous species that have been gathered from literature surveys, reports, and scientific papers.

DATA SCOPE AND FILE CHARACTERISTICS

The majority of the holdings, 2,400, are on micro-fiche which is cross referenced by subject and geographic area. 1,334 articles are in abstract or summary files. 2,808 references are in a geographic reference file. Access is obtained by title, author, locator, or subject. Each reference is assigned a microfiche number. Any reference can be obtained from (either of two) Visu-Trievers within 2 minutes.

APPLICATION

The file was designed for high speed retrieval of data for area studies, intelligence reports, and special study requests.

PLANS FOR THE FUTURE

The present system is open-ended and will be continued.

NAVOCEANO
DATA FILE SUMMARY

CODE: 34213

DATE *October 1978*
~~January 1977~~

TITLE: DISCOLORED WATER

DESCRIPTION OF DATA: Reports of discolored water.

DATA FORMAT: Retrievable reports and bibliographic references, on 3- X 5-
inch cards and microfiche.

UNITS: Not applicable

ACCURACY/PRECISION: Not applicable

SAMPLING INTERVAL:

EXTENT OF COVERAGE: 1,031 Reports

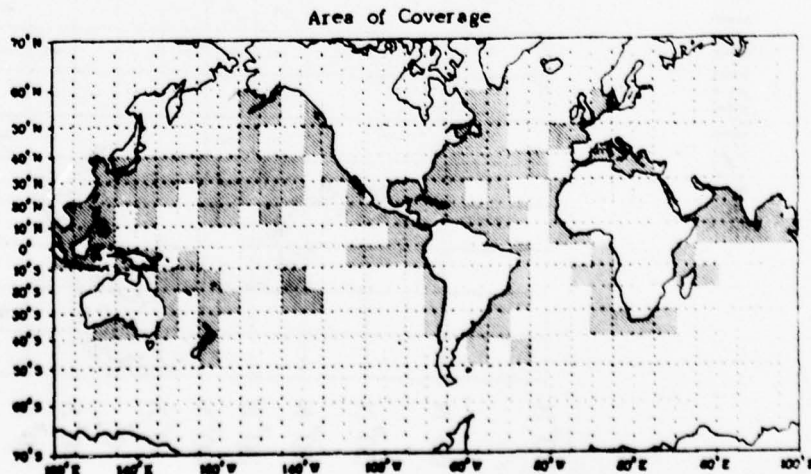
PERIOD OF COVERAGE: 1920-1977

REPOSITORY: *Biology*
~~Biological Data~~ Section (Code 34213)

AREA OF COVERAGE: Worldwide

Adron F. Hall (601) 688-4110
CUSTODIAN: ~~R. F. Staples (202) 433-1022~~

BACKLOG: None



DISCOLORED WATER

INTRODUCTION

The discolored water data file consists of 1,031 reports and observations, contained in two subfiles. The older file is a separate discolored water file. The newer file is part of the bioluminescence data file, since the Navy has not requested discolored water information in recent times.

DATA COLLECTION SYSTEM

All data are selectively gathered from literature surveys.

DATA SCOPE AND FILE CHARACTERISTICS

The data are cross-referenced in a microfiche system as discolored water, bioluminescence (red tide) according to geographic region and title/author/subject.

APPLICATION

The file provides data for area studies, intelligence reports, and special study requests.

PLANS FOR THE FUTURE

Updating of the discolored water reports file has been discontinued. Whatever data are filed are intended to supplement the bioluminescence data file.

NAVOCEANO
DATA FILE SUMMARY

CODE: 34213

DATE *October 1978*
~~January 1977~~

TITLE: FOULING (ATTACHMENT AND ENTANGLEMENT)

DESCRIPTION OF DATA: Types and amounts of fouling, seasonality of attachment, effects on operation of ships and gear, and geographic distribution of organisms.

DATA FORMAT: Panel data sheets and cards, microfiche copies of articles, and reference cards.

UNITS: Not applicable.

ACCURACY/PRECISION: Unknown in most instances.

SAMPLING INTERVAL: Not applicable.

EXTENT OF COVERAGE: 18,800 Panel Data Sheets

PERIOD OF COVERAGE: Panel data: 1947-1962; microfiched articles mostly from
1930 - 1976

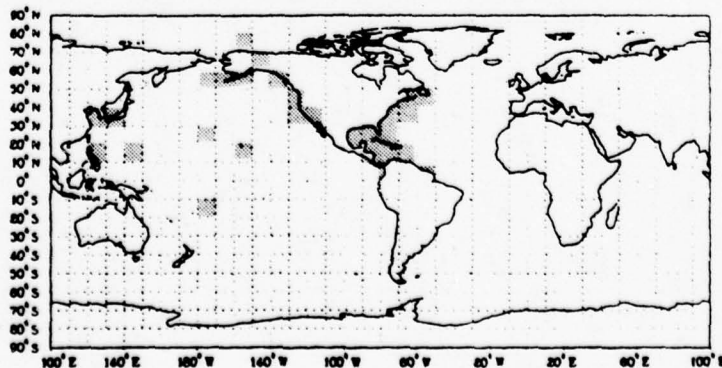
Biology
REPOSITORY: ~~Biological Data~~ Section (Code 34312)

AREA OF COVERAGE: Worldwide

Samuel A. Army (601) 688-4110
CUSTODIAN: ~~D. Marra (202) 433-4235~~

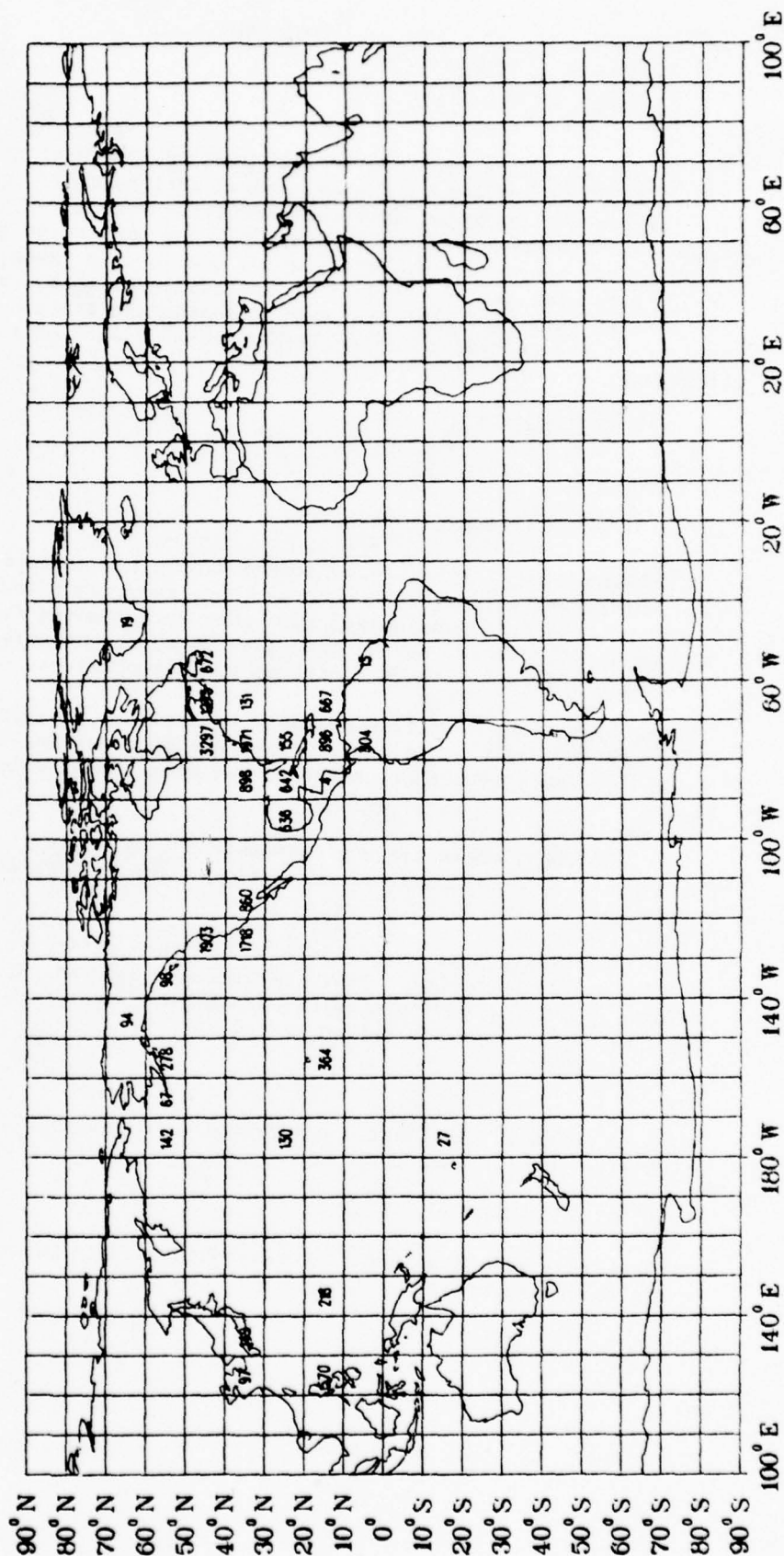
BACKLOG: Approximately 500
articles yet to be microfiched.

Area of Coverage



DISTRIBUTION OF FOULING PANEL REFERENCES

**By 10 Degree Squares
(18, 800 Articles)**



OCTOBER 1978
AS OF JANUARY 1977

FOULING

INTRODUCTION

The fouling data file consists of over 18,800 panel data sheets and cards, 1,500 microfiched articles, and an estimated 500 reprints and copies of articles yet to be put into the microfiche system. Data include descriptions or measurements of the types and amounts of fouling on ships, mines, nets, buoys, piers, test panels, and in some cases, rocks in the area. Data also include variations in fouling by month or season, changes in quantity with time, effects on functioning and efficiency of ships and equipment; and geographic distribution and abundance of fouling organisms, both plant and animal.

DATA COLLECTION SYSTEM

Literature survey.

DATA SCOPE AND FILE CHARACTERISTICS

A large part of the data collected during the earlier years is on data sheets and cards. Each card or sheet shows what fouling was present on one or more test panels each time they were removed from the water. For any one location there may be from 1 to 30 sheets or more. The duration of studies ranged from 2 to 36 months among the locations.

The microfiche data file consists of articles that include fouling data, either wholly or in part. Each are numbered and filed so that they can be retrieved by author, subject, and where applicable, geographic area.

In addition, there are approximately 500 articles that still must be cataloged and microfiched. These articles are on both attachment fouling and marine vegetation.

In addition, there is a file of 3 X 5-inch reference cards arranged alphabetically by author. These references, used as sources for earlier studies, provide a beginning bibliography for future studies. Many of these references are not yet on microfiche.

APPLICATION

Data retrieval is for the purpose of area and special request studies, as well as intelligence documents.

PLANS FOR THE FUTURE

This file will continue to be expanded as data become available in the open literature.

NAVOCEANO
DATA FILE SUMMARY

CODE: 3412

DATE January 1977

TITLE: FOULING PANEL

DESCRIPTION OF DATA: Biofouling community-sample data are collected on standard wood/asbestos test panels in support of mine warfare and other Navy programs. Data are used to forecast fouling conditions worldwide and to assess the effects of biofouling on sensors and materials.

DATA FORMAT: Marine fouling and boring organisms (from individual test panels), their max. sizes (for growth rates), and relative abundance are listed on data sheets. Total dry weight of the attached biomass is measured (for biofouling productivity).

UNITS: Size in millimeters, dry weight in gms/unit, area/unit, time, abundance in percent coverage of test surface.

ACCURACY/PRECISION: Size to ± 1 mm, weight to ± 1 gm, abundance to ± 1 percent.

SAMPLING INTERVAL: Test panels are exposed for 1 month and cumulatively longer to 12 months; sometimes longer. Sampling depths are near bottom in shallow water; at 17- and 33-meter intervals in deep water.

EXTENT OF COVERAGE: 62 Stations

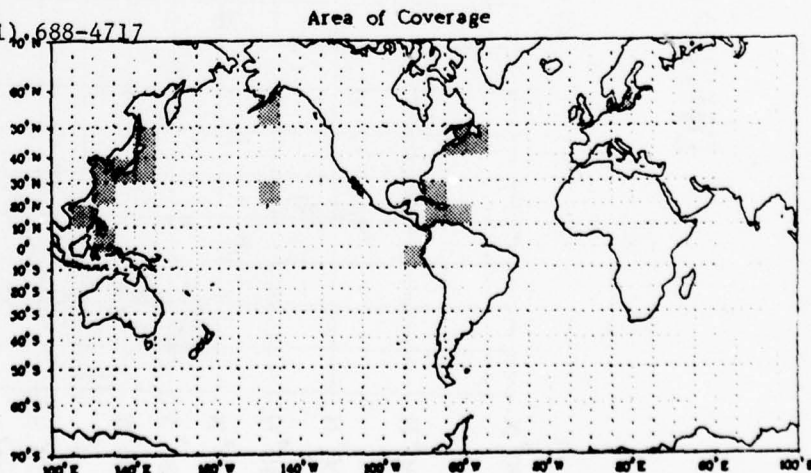
PERIOD OF COVERAGE: 1960 to present.

REPOSITORY: Data sheets and reference collection of specimens in Biology Laboratory (Code 3412).

AREA OF COVERAGE: U.S. and foreign coastal zones.

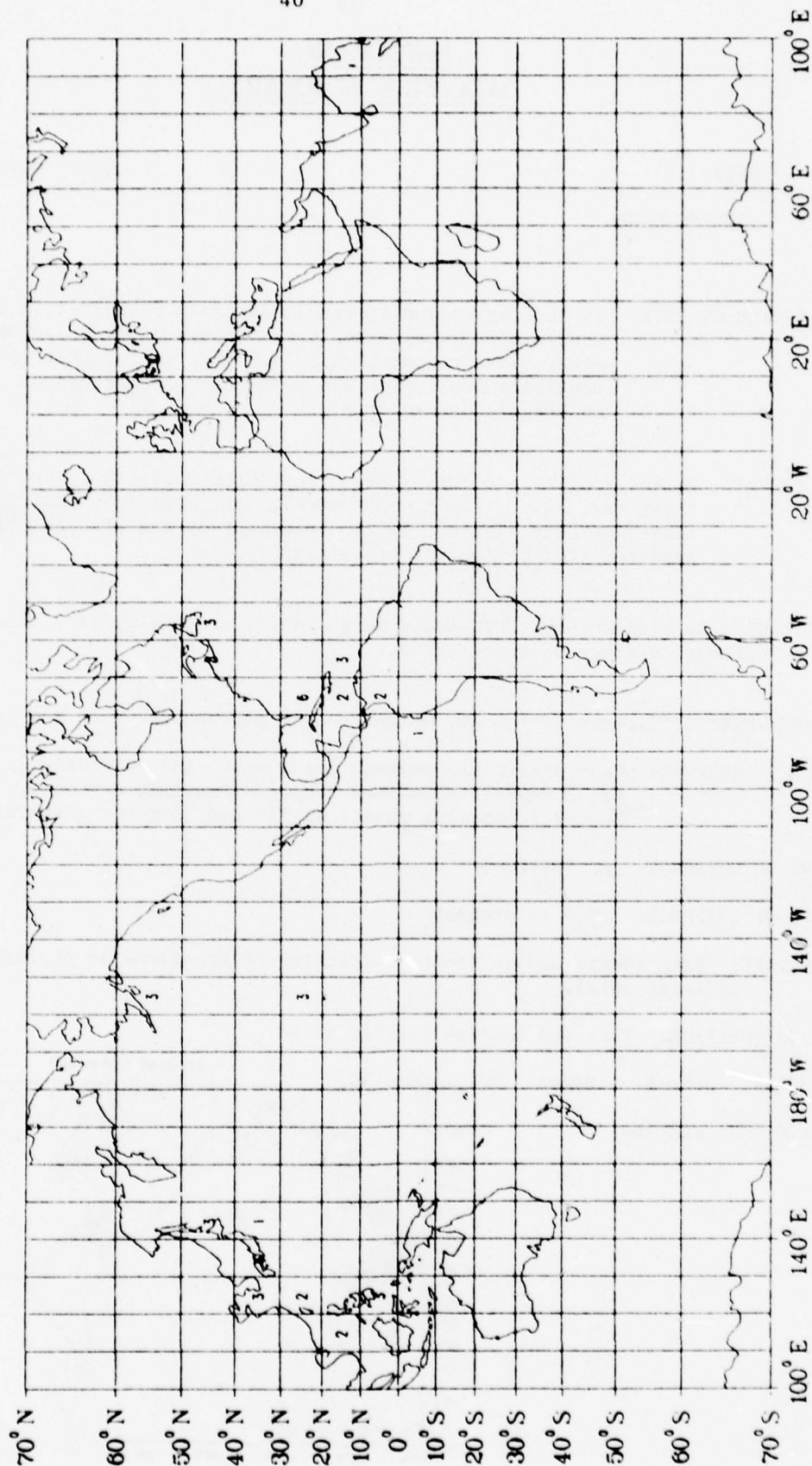
CUSTODIAN: John R. DePalma (601) 688-4717

BACKLOG: 75 samples



DISTRIBUTION OF FOULING PANEL DATA

By 10 Degree Squares
(62 Stations)



AS OF JANUARY 1977

NAVOCEANO
DATA FILE SUMMARY

CODE 34213
TITLE: PLANKTON

DATE *October 1978*
~~January 1977~~

DESCRIPTION OF DATA: Phytoplankton, zooplankton, and various larval planktonic forms of larger organisms, their abundance and distribution by seasons.

DATA FORMAT: Text books, reprints, reports, microfiche, articles.

UNITS: Varied

ACCURACY/PRECISION: Varies

SAMPLING INTERVAL: Not applicable.

EXTENT OF COVERAGE: 1,611 Reports

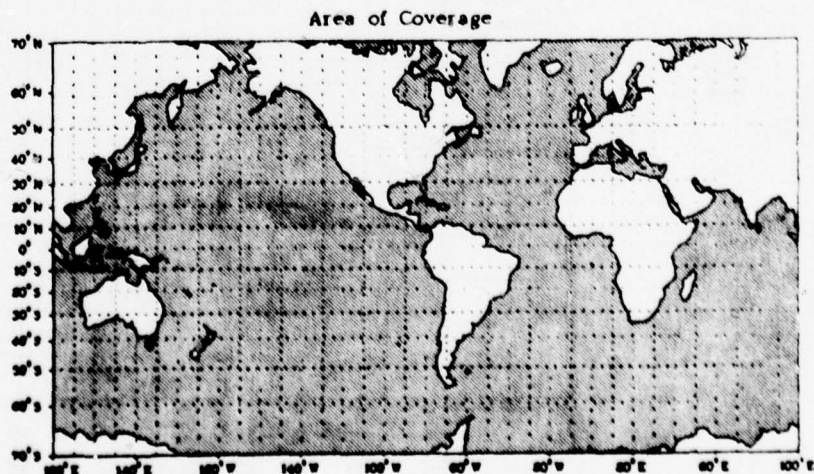
PERIOD OF COVERAGE: 1940 - 1977

REPOSITORY: *Biology*
~~Biological Data~~ Section (Code 34213)

AREA OF COVERAGE: Worldwide

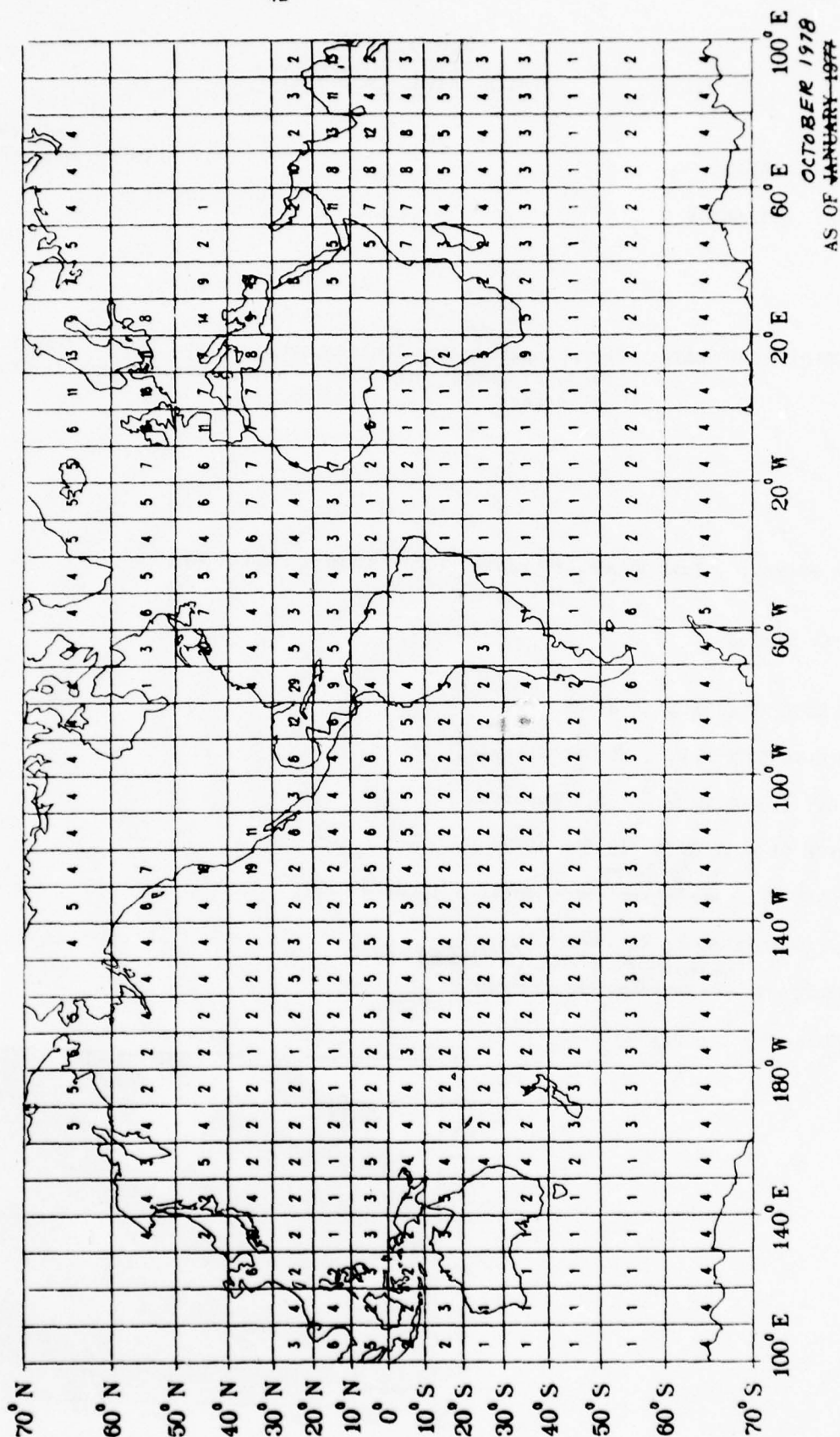
CUSTODIAN: *Adron F. Hall (601) 688-4110*
~~D. Marra (202) 433-4235~~

BACKLOG: Not applicable.



By 10 Degree Squares

(1,611 Reports)



PLANKTON

INTRODUCTION

The Plankton Data File consists of approximately 1,600 article holdings that contain information on kinds, abundance, distribution (areal), and seasonality. Approximately 150 article holdings are of a general nature.

DATA COLLECTION SYSTEMS

The collection contains individual files on phytoplankton, zooplankton, plankton, and Deep Scattering Layer (DSL).

Literature is received from a wide variety of sources, evaluated, and processed into the system.

DATA SCOPE AND FILE CHARACTERISTICS

The majority of the plankton holdings are on microfiche, the remaining references are in the book library.

Some files are cross-referenced in a geographical locator file. Access is attained by either title, author, locator, or subject card files. Each card is assigned a microfiche number. Any reference card assigned a number can be obtained within 2 minutes. Microfiche are stored in two Visu-Triever, which are automated recovery file storages. Micro-film readers are available.

APPLICATION

The system was designed to support data for area studies, intelligence reports, and special study requests.

PLANS FOR THE FUTURE

All biological data files do not lend themselves to digitizing and computerizing. Therefore, the open-ended microfiche accession tradition will be continued.

NAVOCEANO
DATA FILE SUMMARY

CODE: 34322

DATE January 1977

TITLE: RANDOM BATHYMETRY (12 kHz-wide)

DESCRIPTION OF DATA: Bathymetry is obtained using 12-kHz wide beam sounding equipment and recorded on a Raytheon analog chart recorder. 12-kHz wide beam data are not recorded when narrow beam system is in operation.

DATA FORMAT: Microfilm and analog records. A small quantity has been digitized and recorded on magnetic tape.

UNITS: Sonic meters.

ACCURACY/PRECISION: +5 meters

SAMPLING INTERVAL: 1- and 5- minute intervals

EXTENT OF COVERAGE: 34,560

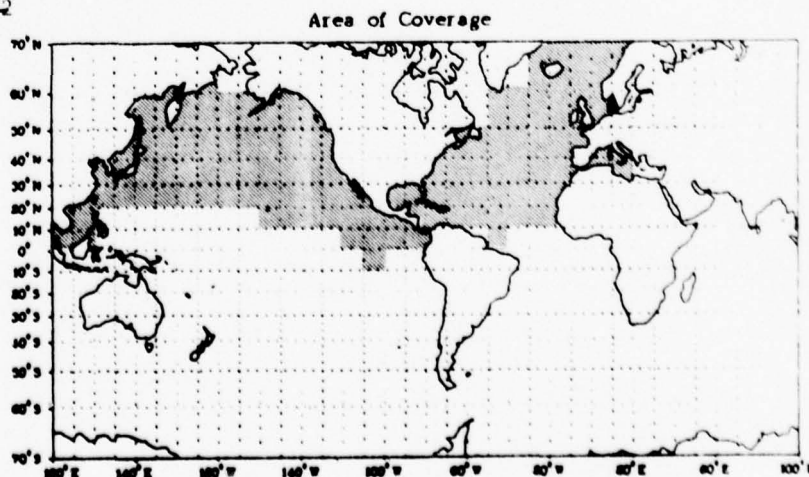
PERIOD OF COVERAGE: 1968-1976

REPOSITORY: Code 34322

AREA OF COVERAGE: Northern Hemisphere

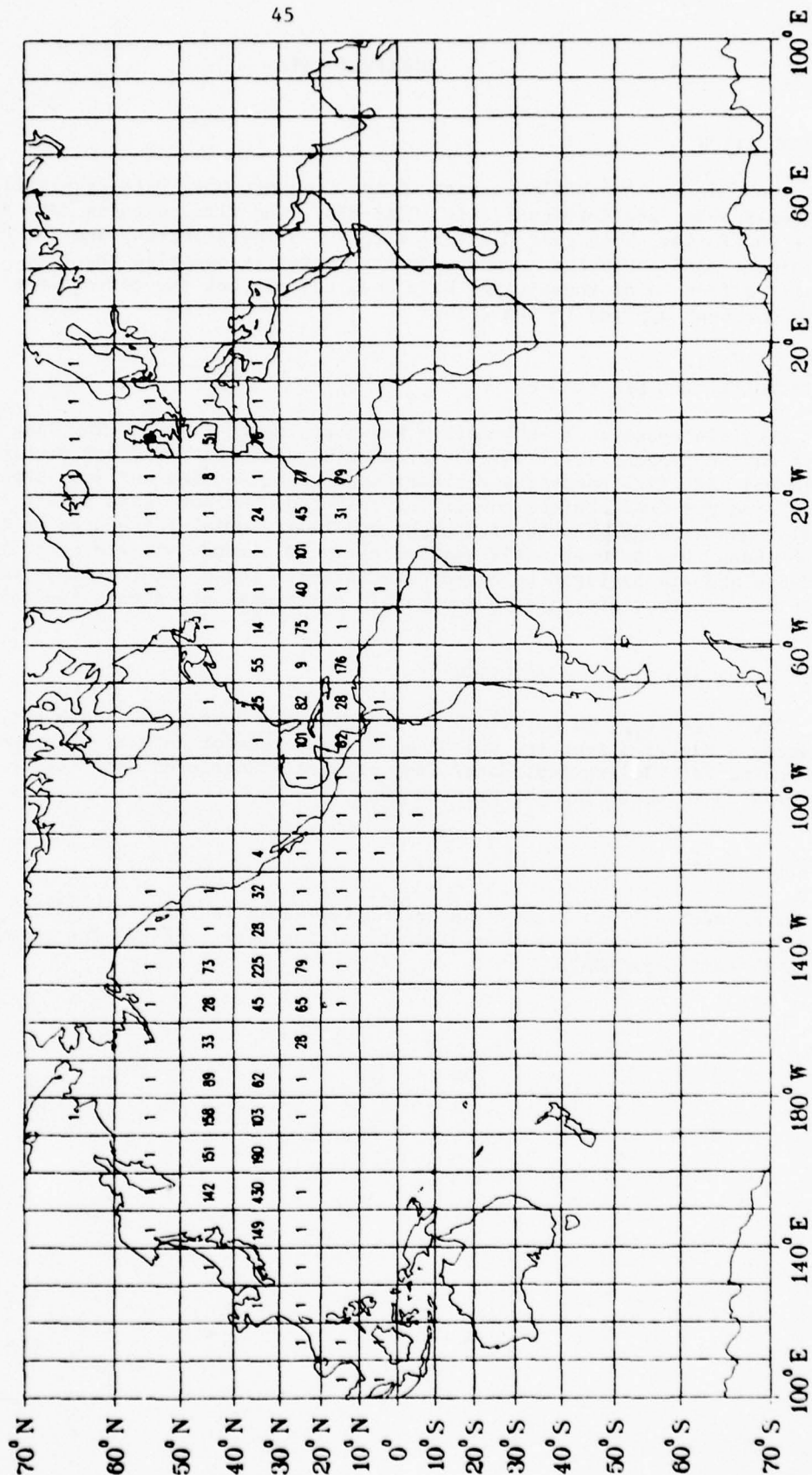
*Bart Keville (601) 688-4242*CUSTODIAN: ~~J. Dail (202) 763-1022~~

BACKLOG: None



DISTRIBUTION OF RANDOM WIDE BEAM BATHYMETRY

By 10 Degree Squares
(3,456 Miles of Track x10)



AS OF JANUARY 1977

UNDERWAY DATA

INTRODUCTION

The Underway Data File is part of the Oceanographic Data Acquisition System-Storage and Retrieval File (ODAS-SR). The file contains data from over 90 cruises, some pre-ODAS (prior to PDP-9 installation) and the remainder ODAS. Nineteen magnetic tapes currently comprise the file. Profiles from 14 of these tapes have been edited, but the corrections have not been applied to the file.

DATA COLLECTION SYSTEMS

The file contains 12-kHz narrow beam bathymetry (Some 12-kHz wide beam data may be present to fill voids created by equipment or other problems.), observed magnetic intensity, residual magnetics, and sea surface temperature. Data from pre-ODAS cruises consist of selected, 5-minute data points from analog traces supplemented with highs and lows. ODAS cruise data on the other hand, are automatically sampled every 10 seconds via readouts from sensors and are averaged to one-minute values. These data are then merged with one-minute, interpolated geographic positions onto a magnetic tape.

DATA SCOPE AND FILE CHARACTERISTICS

The merged tape is entered into the Underway Data File. Each entry updates a master directory, which can be searched for data by ship name, cruise number, Julian day, date/time, or area. Retrieved data can be entered on magnetic tape or printed out.

FUTURE PLANS

The Underway Data File is being compressed to facilitate handling ease and lessen computer usage time, thereby aiding user access. The compressed file is called SAGEBATE.

NAVOCEANO
DATA FILE SUMMARY

CODE: 34322

DATE January 1977

TITLE: RANDOM BATHYMETRY (12 kHz-narrow)

DESCRIPTION OF DATA: Bathymetry is continuously collected in analog form. Data are also digitally sampled every 10 seconds and averaged at 1 minute intervals using 12kHz Harris Model 853D NBES sounding system.

DATA FORMAT: Analog records and digital data on magnetic tape

UNITS: Sonic meters.

ACCURACY/PRECISION: ± 2 meter.

SAMPLING INTERVAL: 1- and 5- minute intervals

EXTENT OF COVERAGE: 232,290

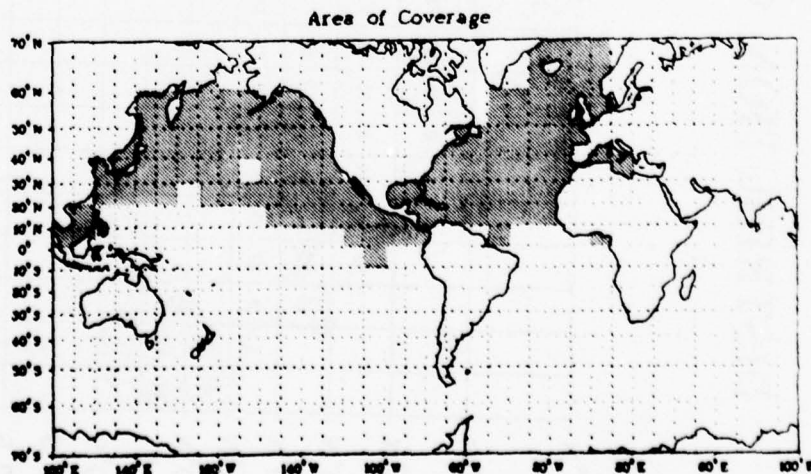
PERIOD OF COVERAGE: 1971-1976

REPOSITORY: Code 34322

AREA OF COVERAGE: N. Pacific, N. Atlantic, Indian Ocean

CUSTODIAN: *Bart Keville (601) 688-4242*
~~J. Dail (202) 763-1022~~

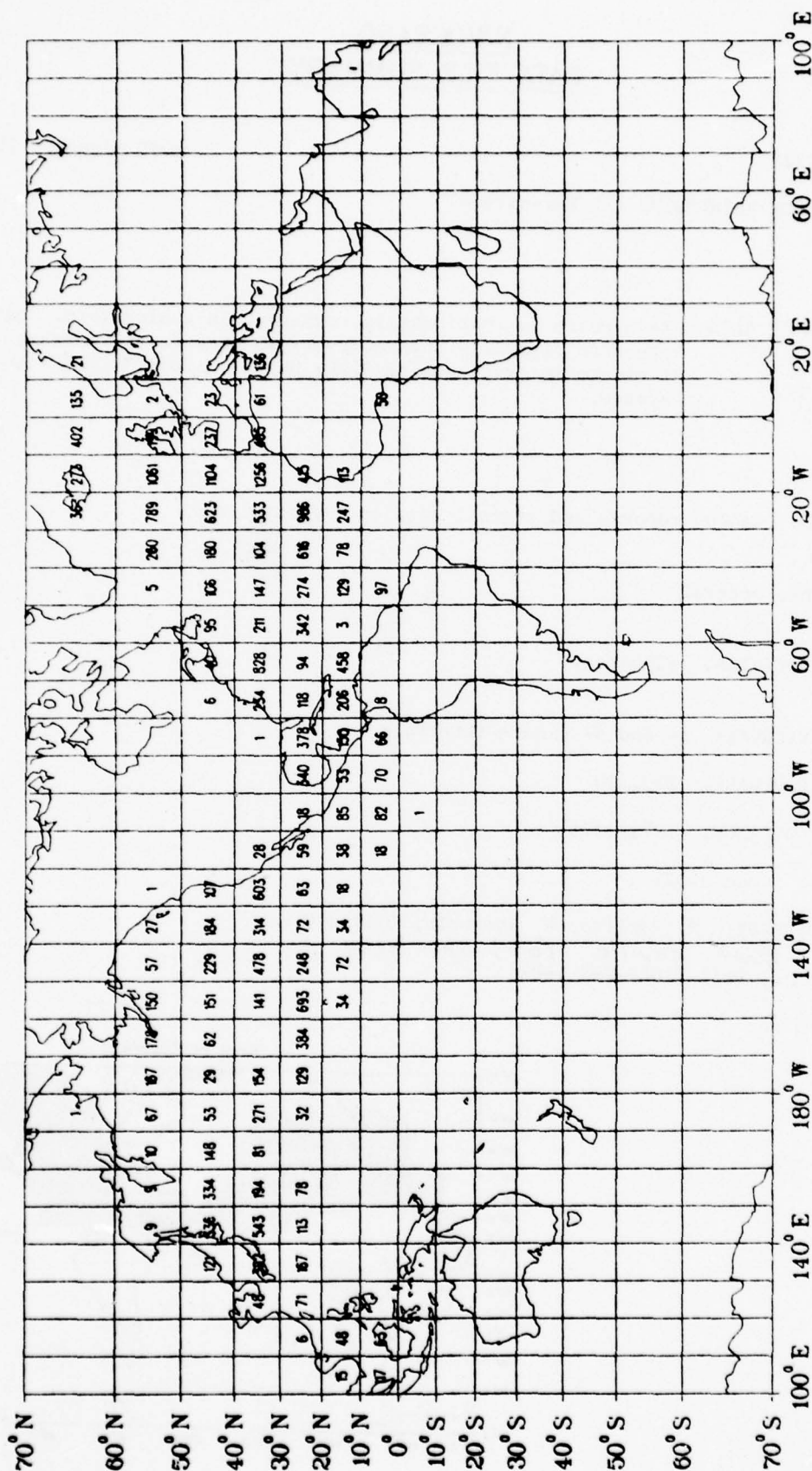
BACKLOG: None



DISTRIBUTION OF RANDOM NARROW BEAM BATHYMETRY

By 10 Degree Squares

(23,229 Miles of Track x10)



AS OF JANUARY 1977

UNDERWAY DATA

INTRODUCTION

The Underway Data File is part of the Oceanographic Data Acquisition System-Storage and Retrieval File (ODAS-SR). The file contains data from over 90 cruises, some pre-ODAS (prior to PDP-9 installation) and the remainder ODAS. Nineteen magnetic tapes currently comprise the file. Profiles from 14 of these tapes have been edited, but the corrections have not been applied to the file.

DATA COLLECTION SYSTEMS

The file contains 12-kHz narrow beam bathymetry (Some 12-kHz wide beam data may be present to fill voids created by equipment or other problems.), observed magnetic intensity, residual magnetics, and sea surface temperature. Data from pre-ODAS cruises consist of selected, 5-minute data points from analog traces supplemented with highs and lows. ODAS cruise data on the other hand, are automatically sampled every 10 seconds via readouts from sensors and are averaged to one-minute values. These data are then merged with one-minute, interpolated geographic positions onto a magnetic tape.

DATA SCOPE AND FILE CHARACTERISTICS

The merged tape is entered into the Underway Data File. Each entry updates a master directory, which can be searched for data by ship name, cruise number, Julian day, date/time, or area. Retrieved data can be entered on magnetic tape or printed out.

FUTURE PLANS

The Underway Data File is being compressed to facilitate handling ease and lessen computer usage time, thereby aiding user access. The compressed file is called SAGEBATE.

NAVOCEANO
DATA FILE SUMMARY

CODE: 3432

DATE January 1977

TITLE: BATHYMETRY 3.5 KHz-Random

DESCRIPTION OF DATA: 3.5-KHz subbottom profiles (wide beam bathymetry) obtained with an EDO Western Model 240 system are recorded on a Raytheon analog chart recorder.

DATA FORMAT: Microfilm and analog records

UNITS: Sonic meters

ACCURACY/PRECISION: ± 5 meters

SAMPLING INTERVAL: Continuous

EXTENT OF COVERAGE: 460,000 miles of track

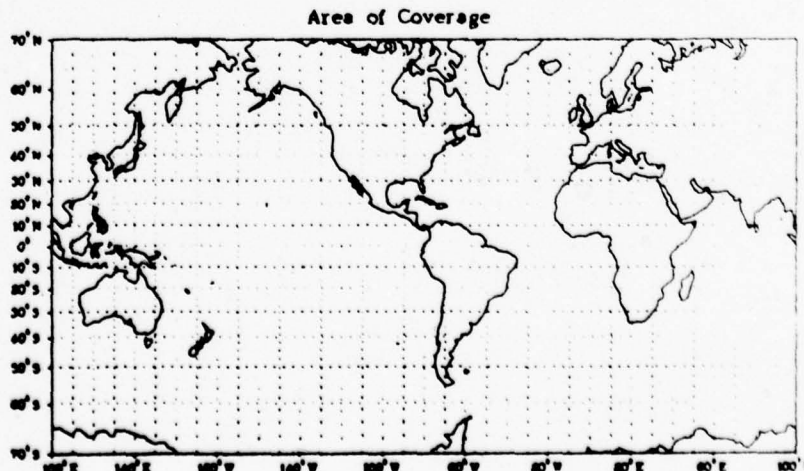
PERIOD OF COVERAGE: 1968 - 1977

REPOSITORY: Code 3432 Microfilm Library

AREA OF COVERAGE: Worldwide

CUSTODIAN: *Bart Keville (601) 688-4242*~~J. Dail (202) 763-1022~~

BACKLOG: 6 Cruises



DISTRIBUTION CHART

NOT YET AVAILABLE

BATHYMETRY 3.5 KHz-RANDOM

INTRODUCTION

The 3.5-KHz subbottom profile data file consists of analog recordings from 460,000 nautical miles of survey operations conducted by the Naval Oceanographic Office.

DATA COLLECTION SYSTEM

The file contains analog records obtained with an EDO Western Model 240 system and recorded on a Raytheon analog chart recorder.

DATA SCOPE AND FILE CHARACTERISTICS

Approximately 90 percent of the 3.5-KHz bathymetry analog records are microfilmed and filed for reference. The original analog records are sent to Federal Records Center for storage. Retrieval is by cruise number or microfilm file number.

APPLICATIONS

The 3.5-KHz bathymetry is available for use as original analog data or microfilm.

FUTURE PLANS

New data will be microfilmed and catalogued as it becomes available through future survey operations.

NAVOCEANO
DATA FILE SUMMARY

CODE: 34324

DATE January 1977

TITLE: BATHYMETRY (CHART WORKING)

DESCRIPTION OF DATA: Sounding sheets: uncorrected meters or fathoms at 1:1,000,000 scale. Track sheets: at 1:1,000,000 or 1:4,000,000. Contour sheets: uncorrected meters and fathoms at 1:1,000,000 or 1:4,000,000. Contour interval varies from 20 meters (10.9 fm) to 500 meters (273.4 fm).

DATA FORMAT: Manually plotted soundings and hand-drawn contours and tracks.
All data retrieved manually according to B.C. Area (1:1,000,000) or Regional Area (1:4,000,000).

UNITS: Uncorrected fathoms and meters.

ACCURACY/PRECISION: Location accuracies vary from a classified distance to 15 miles. Sounding accuracies vary from classified precision measurements to uncorrected random soundings.

SAMPLING INTERVAL: 3 min. to 60 min. depending on type of survey.

EXTENT OF COVERAGE: 1,145 Charts

PERIOD OF COVERAGE: 1972 - 1977

REPOSITORY: Marine Geomorphology Section (Code 34324)

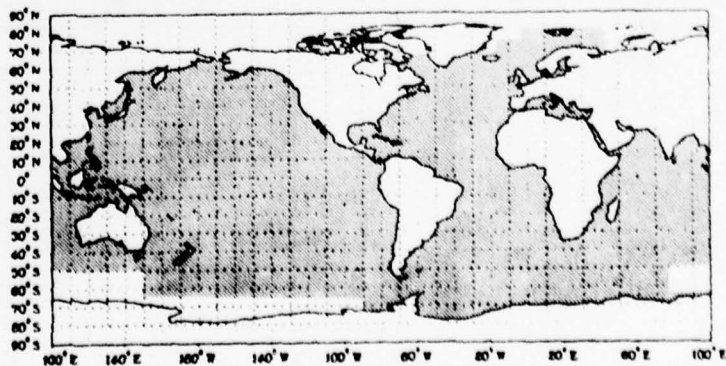
AREA OF COVERAGE: Worldwide

(601) 688-4070

CUSTODIAN: F. Marchant (202) 763-1206



BACKLOG: N.A.

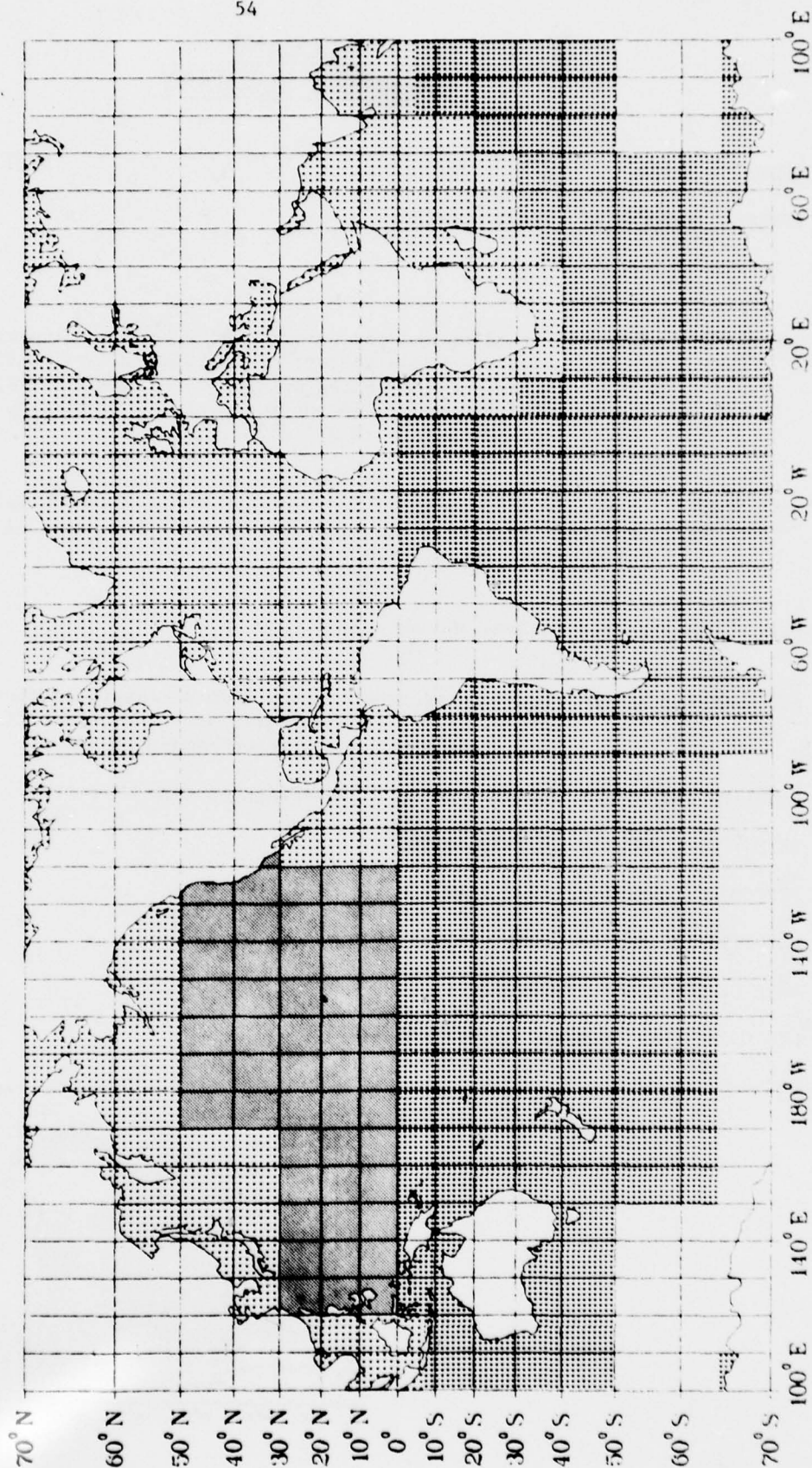
Area of Coverage



DISTRIBUTION OF BATHYMETRIC WORKING CHARTS

By 10 Degree Squares
AT A SCALE OF 1:4,000,000

CONTOUR INTERVAL
 200 METERS
 500 METERS
 100 FATHOMS

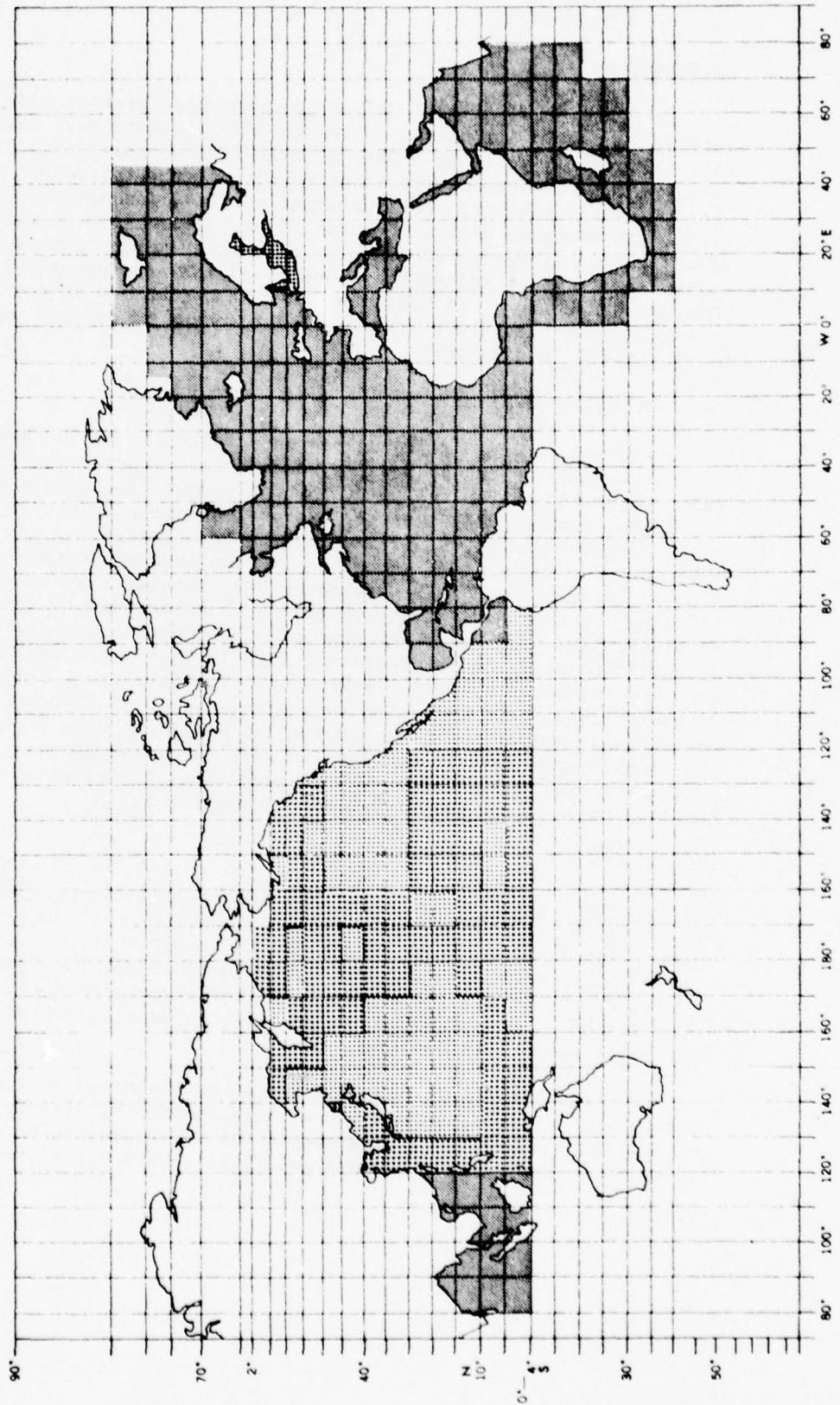


AS OF JANUARY 1977

DISTRIBUTION OF BATHYMETRIC WORKING CHARTS

CONTOUR INTERVAL
 20 METERS
 200 METERS
 100 FATHOMS
 200 FATHOMS

AT A SCALE OF 1:1,000,000
 IRREGULAR LATITUDINAL INTERVALS



BATHYMETRY

INTRODUCTION

The Naval Oceanographic Office has conducted precise bathymetric surveys in nearly all oceans of the world. The data have been collected over the past 18 years at a rate of over 250,000 nmi/year. The data obtained on these surveys are used to meet multiproduct requirements of world charting, antisubmarine warfare, and special charts and studies in advanced military applications. These surveys were systematically conducted on a continuous basis aboard Ocean Survey Program (OSP) ships. Array sonar systems have been used and have greatly increased coverage since 1967. In addition, NAVOCEANO compiles bottom contour charts of lesser accuracy from multisource data to satisfy various oceanographic requirements.

DATA COLLECTION SYSTEMS

Shipboard surveys are conducted on a full-time basis aboard four OSP ships, also on an opportunity basis aboard other oceanographic ships under technical control of NAVOCEANO and unique Fleet vessels. These ships are equipped with computer systems, automated plotters, Precision Depth Recorders (PDR), stabilized UQN/SQN sonar systems, and array sonar systems. The navigation system obtains continuous position information through automated SINS/DR, updated by Navy Satellite System, Loran-C, and other precise navigation systems, such as acoustic bottom transponders. Horizontal and vertical references are the inertial systems corrected by satellite position information. Time is based on a Cesium Time Standard corrected by National Observatory Information. All vertical depth recordings are collected to a precision of ± 1 fathom. Sufficient lithographic-cartographic procedures and equipment have been established aboard ships, so that in conjunction with automated plotters and available software they can provide survey ship editions of collected data as required to meet the priority needs of the Fleet.

DATA REDUCTION

Information System. The purpose of the Ocean Surveys Information System is to assure the availability of globally collected oceanographic information for incorporation and use in products of the U. S. Naval Oceanographic Office, components of the Defense Mapping Agency, and special Fleet units. The system is primarily concerned with the accumulation of source documents and digital data collected from systematic deep-ocean surveys.

The Ocean Surveys Information System maintains an active document storage and retrieval system for primary documents, microfilm copies, and digital data recorded on magnetic tape. The source materials are collected during planned surveys and Fleet vessel operations. Secondary

documents such as computer-generated catalogs and indexes are produced by the system for easy access to items in the store. The largest category of items falls under the heading of bathymetry. All primary documents and source data go into the collection, where they remain indefinitely. Full-size hard copy is converted into permanent microfilm retention copies, and the hard copy is usually destroyed.

In addition, Regional Contour Maps are maintained in a file within NAVOCEANO for updating the contours and answering requests for the maps. The Regional Contour Map holdings are listed in the Product Inventory Catalog that is available in a classified and unclassified version. The Product Inventory Catalog also lists a number of BC (Bottom Contour) maps at approximately a 1:1 million scale. These contour sheets and supplemental sounding and track sheets were constructed in prior years as input to the Regional Contour sheets. The published and unpublished contour maps from other sources are maintained in the map file. This is a working file maintained as a convenience in referencing other interpretations or in providing information for areas where no Regional Contour maps are available. The Map Inventory Catalog, consisting of a locator section and the inventory section, lists these holdings. A literature file consisting of about 200 looseleaf notebooks containing about 4,000 individual articles and arranged by ocean areas is also maintained.

Survey Data Reduction. Sonar array and navigation data are recorded on magnetic tape in the field. In-house processing of the sonar array depth data consists of reformatting the data and packing the tapes at a ratio of approximately fifteen to one. During the packing process a computer listing is obtained that is used to compare with the field tape logs, and observed discrepancies are resolved and corrected in an additional computer run.

Navigation data are processed at this time through six different computer programs, in which erroneous data are either removed or corrected and the final navigation data are smoothed and adjusted to satellite datum.

Sonar and navigation data are processed through various computer programs to generate plotter tapes for displaying the data off-line. Bathymetric contours are plotted at various contour intervals and chart scales depending upon the type of chart being produced.

Data Reduction Facilities. All data are processed on the UNIVAC 1108 computer with the exceptions of azimuth and distance computations, which are processed on the NOVA 800 computer. Analog data are digitized currently on the CALMA Models 303 and 485 digitizers. Data are displayed off-line currently on CalComp Models 763 and 765 drum plotters and CalComp Model 718 flatbed plotter. Data files and programs are retained in the NSTL tape library.

APPLICATIONS

Military Applications. The primary use of all precise bathymetric survey data is for the compilation of special purpose charts for military applications.

World Charting. All survey data are used to support nautical chart and bathymetric chart production. NAVOCEANO is preparing, in conjunction with ONR and DMA, a plastic relief wall chart from which a worldwide digital data base at 5-minute intervals will be an end product.

Scientific/Economic. The bathymetric and navigational data are used to locate major oceanic ridges, fracture zones, seamounts, basins, navigational hazards, and other geologic features relating to navigation and acoustic problems. Through correlation and modeling techniques the data may be used to support geomorphological studies and scientific investigations related to plate tectonics. They can also be used to aid oil and mineral exploration.

Equipment. State-of-the-art improvement in navigation and sonar equipment has resulted from NAVOCEANO data collection efforts and has been used in other surveys. In addition to acquiring navigational and bathymetric environmental data, the equipment and systems on NAVOCEANO ships have been used to search for sunken vessels (THRESHER, SCORPION, etc.), ordnance, buoys, and aircraft.

FUTURE PLANS

Information Systems. The system will continue to grow because of the additions to both the digital data base and document storage. If additional resources were made available, it should be possible to sanitize major portions of the data base, allow the use of on-line terminals and, therefore, wider access and distribution.

Survey Systems. The shipboard systems are continuously updated to obtain maximum use of operational ship time.

Surveys. Shipboard ocean surveys will continue in the OSP requirement areas.

NAVOCEANO
DATA FILE SUMMARY

CODE: ~~34222~~ ³⁴²¹³

DATE ~~January 1977~~ ^{October 1978}

TITLE: BEACH ELEVATION PROFILES

DESCRIPTION OF DATA: Profiles of beach elevation from about 3 feet above MLW to about 3 feet below MLW.

DATA FORMAT: Graphic presentations

UNITS: Feet

ACCURACY/PRECISION: \pm 0.05 foot vertical
 \pm 0.5 foot horizontal

SAMPLING INTERVAL: 100 feet - 1,000 feet

EXTENT OF COVERAGE: 584 Profiles

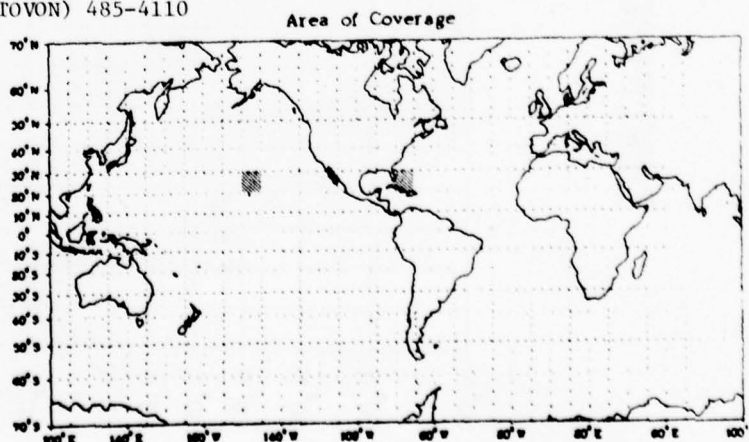
PERIOD OF COVERAGE: 1966 - 1975

REPOSITORY: Code ~~34222~~ ³⁴²¹³

AREA OF COVERAGE: Bahamas, Hawaii

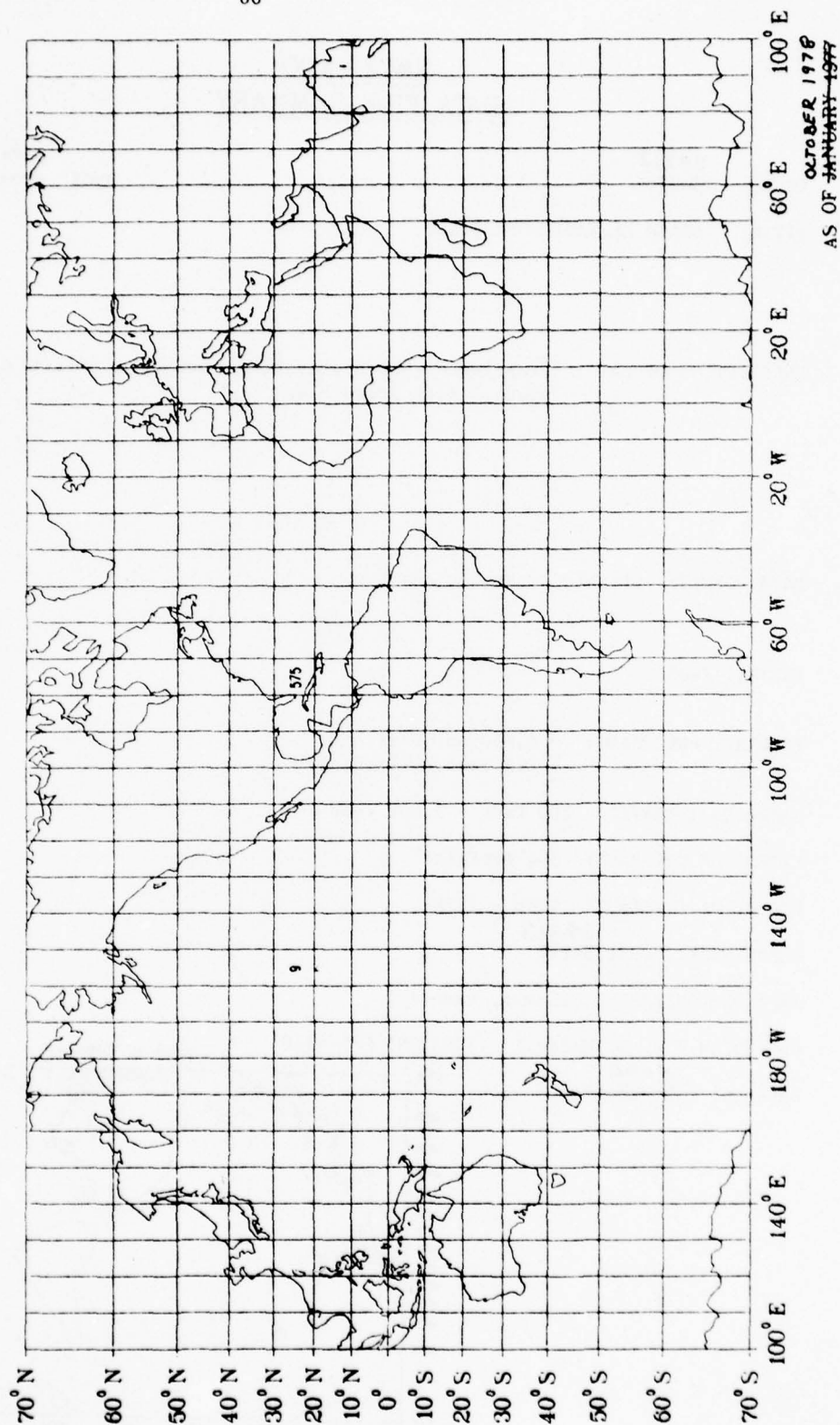
CUSTODIAN: H. D. Huddell (AUTOVON) 485-4110

BACKLOG: ~~12~~ ^{NONE} profiles



DISTRIBUTION OF BEACH ELEVATION PROFILES

By 10 Degree Squares
(584 Profiles)



BEACH ELEVATION PROFILES

INTRODUCTION

Beach elevation profiles are measured to enable monitoring of modifications to the shoreline due to construction of breakwaters, piers, and channels. Resurveying is done at regular intervals, preferably in the same season.

DATA COLLECTION SYSTEMS

During the initial survey, beach profile locations are selected and a heavy steel stake is driven into the ground in the backshore area to mark the shoreward end of each profile. A theodolite and surveyor's tape are used to locate each stake with reference to geodetic monuments. The elevation of each stake with respect to mean sea level is determined by level lines surveyed from geodetic monuments. The profiles extend at right angles to the shoreline to a point approximately 3 to 4 feet below mean sea level. A wire, marked every 10 feet with a brightly colored cloth, is laid from the stake to the end of the profile. A theodolite placed over the stake is used to determine the angle of the profile with respect to prominent features. Standard leveling procedures, using a Wild level are employed to determine the elevation at each mark on the wire. During subsequent surveys, the stakes serve as locaters for each profile and as benchmarks for vertical control.

DATA SCOPE AND FILE CHARACTERISTICS

Final profile drafts are catalogued and filed by survey. *Profiles are printed in special publications and technical notes.*

APPLICATIONS

Profiles are used for comparison to determine shoreline modifications due to natural or manmade causes.

PLANS FOR THE FUTURE

No changes in present method of operation or data filing system are anticipated.

NAVOCEANO
DATA FILE SUMMARY

CODE: 34322

DATE January 1977

TITLE: BOTTOM CORE INDEX

DESCRIPTION OF DATA: Each record contains the core name, originator's index or source number, position, depth, and type of core. No detailed information concerning core composition is contained in this file. Except for cores taken by this office, core analysis information must be requested from the originating institution (i.e. Scripps, Woods Hole, NGSDC).

DATA FORMAT: Data are sorted by six general ocean areas, Marsden Square ($10^\circ \times 10^\circ$), and alphabetical order by core name. Each of the six general areas are stored within a separate file on one magnetic tape. Within a file the blocks are stored in numerical order by Marsden Squares. There are a maximum of 150 records (1,053 36-bit words) in a block. Each record contains seven words and the entire block has a three-word header record.

UNITS: Depths are in uncorrected meters and position is to 1/10 minute.

ACCURACY/PRECISION: N/A

SAMPLING INTERVAL: Varying.

EXTENT OF COVERAGE: 38,571 Cores

PERIOD OF COVERAGE: 1883 to 1975.

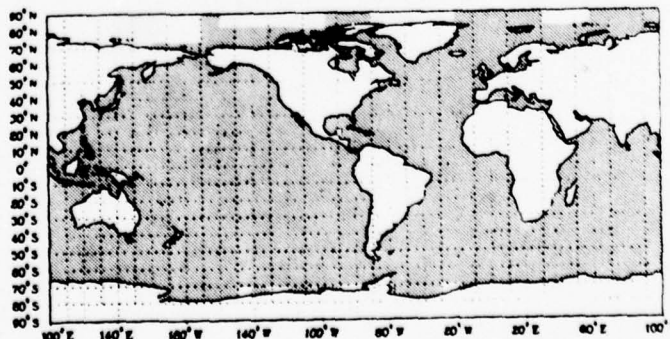
REPOSITORY: Magnetic tape library (Code 5400)

AREA OF COVERAGE: Worldwide

CUSTODIAN: *Bart Keville (601) 688-4242*
~~J. Hoffman (202) 763-1090~~

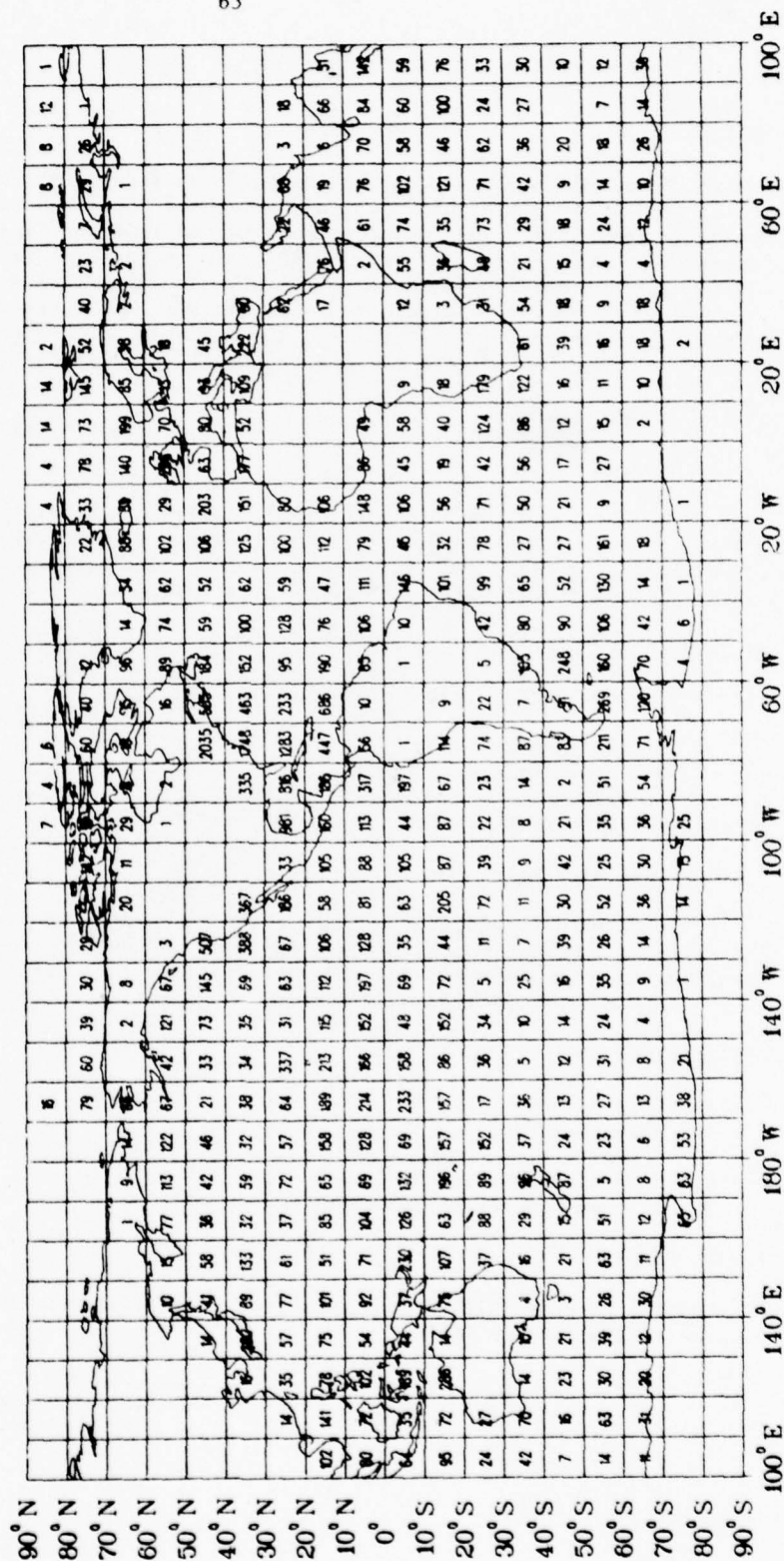
BACKLOG: None

Area of Coverage



DISTRIBUTION OF BOTTOM CORE DATA

By 10 Degree Squares
(38, 571 Cores)



AS OF JANUARY 1977

BOTTOM CORES

INTRODUCTION

The Naval Oceanographic Office maintains an index file consisting of the geographic position, depth, and source of 38,571 bottom cores from worldwide locations. This information obtained from the National Ocean Research and Development Activity (NORDA), is on magnetic tape and is sorted and compacted for efficient data retrieval. The digitized data input to this system consists of information from Scripps Institution of Oceanography, Woods Hole Oceanographic Institution, the National Geophysical and Solar-Terrestrial Data Center (NGSDC), and the Naval Oceanographic Office.

DATA COLLECTION SYSTEMS

A. Field.

In the field the bottom cores are collected either by piston or gravity corers. These cores vary in length from 2 to 60 feet. They are taken in plastic tubes and stored vertically. Some cores are analyzed in the field for engineering and textural properties.

B. Laboratory.

In the laboratory the cores are analyzed for:

1. Grain size
2. Engineering properties

An analysis report is written and a copy sent to NGSDC.

C. Data Processing.

Information relating to these cores is keypunched manually. The computer indexes, sorts, and merges these values and generates a magnetic tape consisting of all this information. The data are retrieved by geographic area, plotted, and listed.

APPLICATIONS

1. Engineering
2. Acoustics
3. Scientific
4. Mine and submarine warfare
5. Oil and mineral exploration

FUTURE PLANS

Updates to this file will be made periodically as new information becomes available from NORDA.

NAVOCEANO DATA FILE SUMMARY

CODE: 3520

DATE January 1977

TITLE: Geomagnetic Survey Data

DESCRIPTION OF DATA: Airborne vector (fluxgate) and metastable helium magnetometers collect magnetic measurements of inclination and declination routinely at 10,000 ft. altitudes and at 500 ft. altitudes for special surveys. Shipboard magnetometer measurements are taken with proton precession magnetometers.

DATA FORMAT: 60% analog and 40% digital.

UNITS: Nanoteslas (gammas)

ACCURACY/PRECISION: Airborne - ± 0.01 nanotesla sensitivity and ± 1 nanotesla absolute intensity. Shipboard - ± 1 nanotesla sensitivity.

SAMPLING INTERVAL: Airborne - 4 measurements per second
Shipboard - 1 measurement per 6 seconds

EXTENT OF COVERAGE: 10.5 Million miles of survey track.

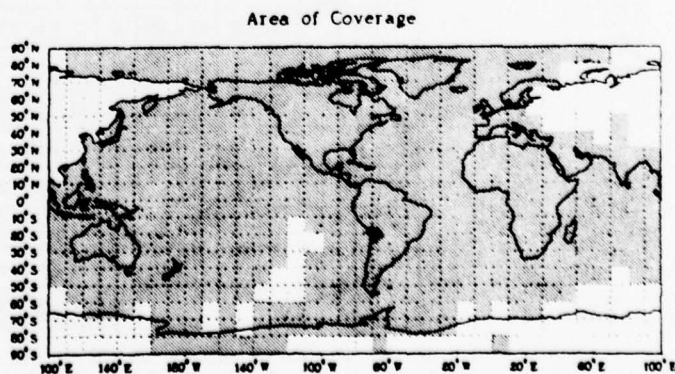
PERIOD OF COVERAGE: 1953-1977

REPOSITORY: DOD Geomagnetic - Data Library, NAVOCEANO Code 3520

AREA OF COVERAGE: Worldwide

CUSTODIAN: F. Waits
(601) 688-4250 ✓

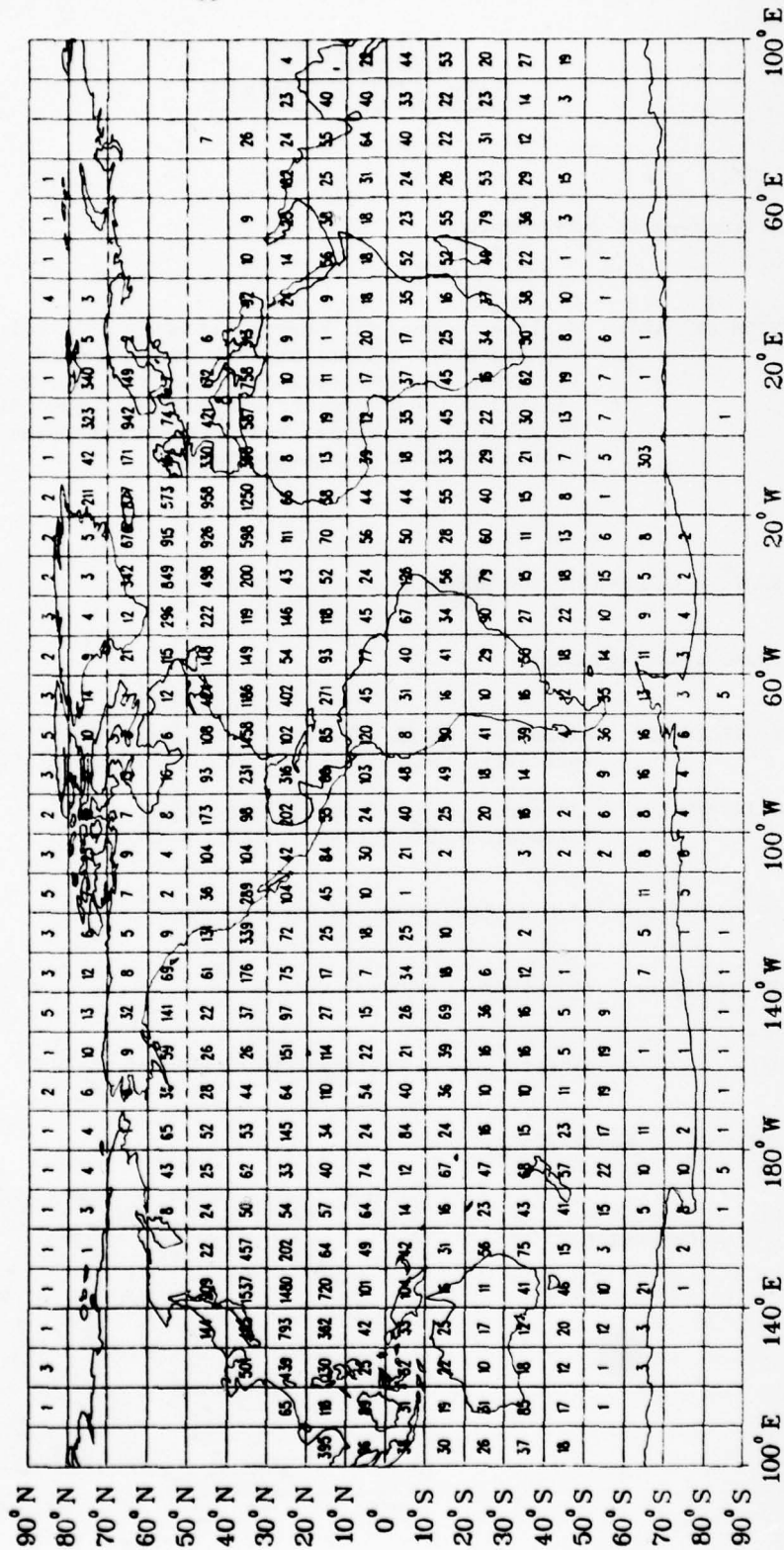
BACKLOG: 8.5 ship years



DISTRIBUTION OF GEOMAGNETIC DATA

By 10 Degree Squares

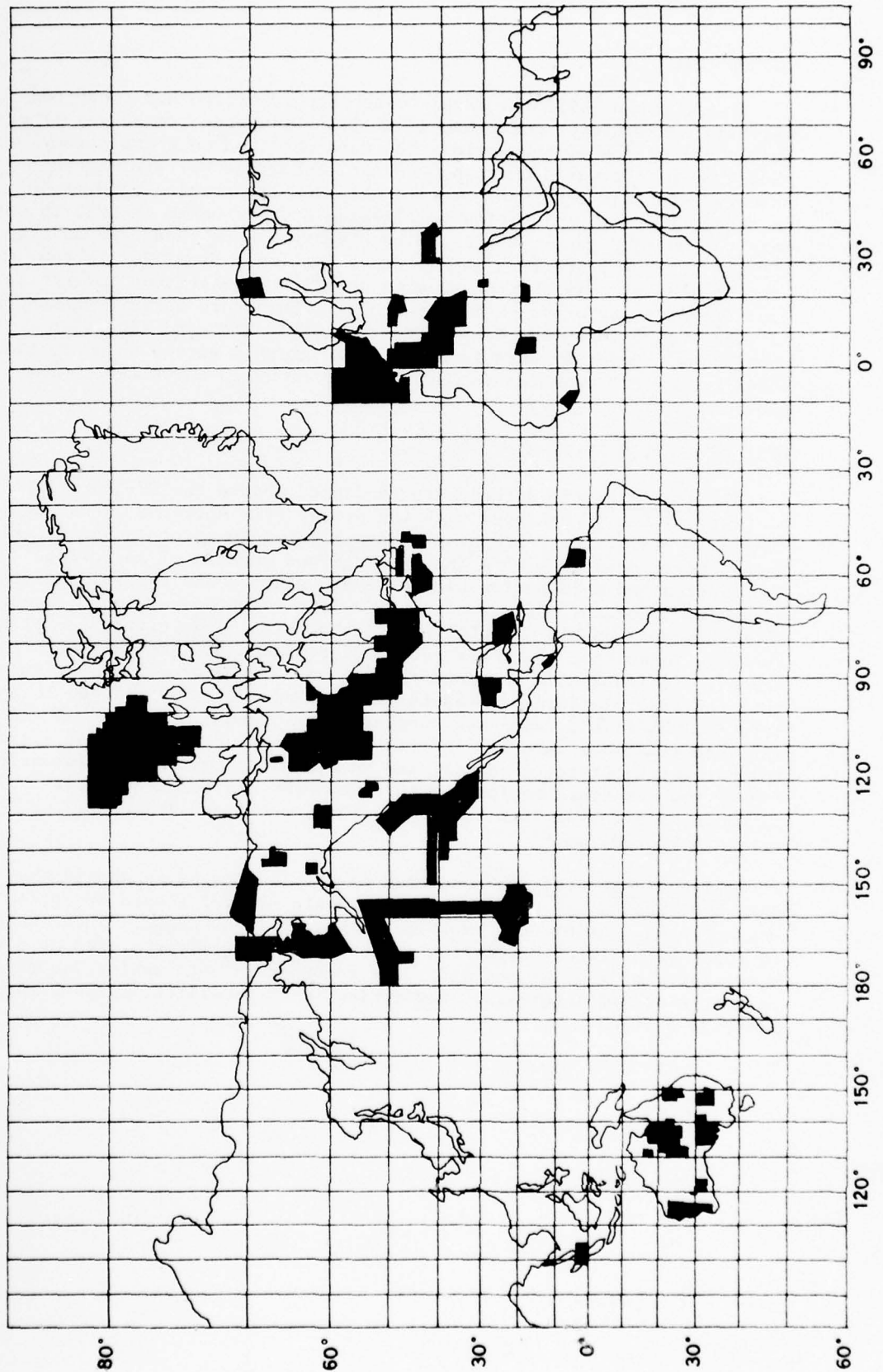
(41,477 Miles of Track x100)



AS OF JANUARY 1977

DISTRIBUTION OF GEOMAGNETIC DATA

By 10 Degree Squares
EXTERNAL DATA ACQUISITION



INTRODUCTION

At the end of 1976 the Naval Oceanographic Office had conducted magnetic surveys over more than 13 million kilometers of survey track in nearly all oceans of the world. The data obtained on these surveys are used to meet the world charting and Anti-Submarine Warfare/Magnetic Anomaly Detection (ASW/MAD) requirements and for special studies in advanced military applications. Airborne surveys began in 1953 to obtain data for World Magnetic Charts. These surveys were conducted at high altitude (3-8 km) and wide (400m) track spacing. From 1957 to the present emphasis has shifted to more detailed low-altitude surveys for specific military or scientific purposes. Shipboard surveys commenced in 1958 aboard the Ocean Survey Program (OSP) ships and have been continuous. Underway data from the oceanographic survey ships is also added to the DoD Geomagnetic Data Library of which NAVOCEANO is the manager.

DATA COLLECTION SYSTEMS

Airborne magnetic surveys are conducted aboard the RP-3D Project MAGNET aircraft, which is equipped with the Geomagnetic Airborne Survey System (GASS). This system contains two magnetometer sensors: a Vector (Fluxgate) Magnetometer mounted within the fuselage and capable of measuring Inclination and Declination within ± 6 arc minutes and total intensity within ± 9 gammas absolute, and a metastable helium magnetometer sensor mounted in a tail boom and capable of 0.01 gamma (nanoteslas) sensitivity and ± 1 gammas absolute intensity. Data are recorded at a rate of 4 measurements per second. Navigation is obtained through an ASN-101 electrostatic suspended gyro inertial platform, an ASN-84 inertial platform, satellite, Loran-C, Loran-A, OMEGA/VLG, radar and Doppler radar systems. Horizontal and vertical references are the inertial systems, a precision radar altimeter and barometric pressure sensor, and an automated sextant. Information is fed to two computers equipped with tape decks and teletypewriters. Time is based on a Cesium Time Standard. The low-altitude range of the aircraft is 5000 km.

Shipboard surveys are conducted on a full-time basis aboard the four OSP ships and on all underway oceanographic cruises aboard the other oceanographic ships under technical control of NAVOCEANO. These ships are equipped with proton precession magnetometers usually operated at a sensitivity of 1 gamma and with data recorded in both analog and digital form at 6-second intervals. Navigation is by Satellite, Loran-C and inertial systems.

DATA REDUCTION AND FILES

Survey Data Reduction. Geomagnetic data are received from field survey operations primarily in digital form. These data are first processed through several error check and analysis programs and merged with navigation data. They can then be processed through various computer programs; including, the derivation of magnetic temporal variation curves from computing differences at survey cross-track intersections, correcting observed data for these variations, the computation of residual magnetic intensity by removal of the International Geomagnetic or American World Chart Reference Fields (IGRF or AWC), and cubic spline interpolation and contouring programs. These programs result in magnetic tapes to automatically plot corrected total or residual intensity values at even (selectable) contour intervals with respect to geographic position, residual intensity profile, and total and residual intensity contour charts.

Data Analysis. Programs are available to pass data through simulated magnetic anomaly detection filters, perform spectral analysis, or compute derivatives of field. Other programs and techniques provide "three-dimensional" displays and removal of surfaces.

Data Banks. The Geomagnetism Division is also responsible for maintaining the DoD Geomagnetic Data Library, which receives data from NAVOCEANO surveys; Geological Survey of Canada; Bureau of Mineral Resources, Australia; U.S. oceanographic institutions; National Oceanographic and Atmospheric Administration (NOAA); and other government agencies. Data for various foreign countries are received from the U.S. State Department Geographic Office survey data are stored in digital files by ship/aircraft, survey operation number, and/or area. They can be retrieved by any of those parameters or time. Approximately 60 percent of the data are still in analog or chart form with the backlog to be eliminated by 1982.

Coverage. Geomagnetic survey coverage for "detailed" surveys is at 35-km track spacing or closer. In addition, there are data for over 4 million km of single tracks. An estimated total of 17 million track km of data are currently held.

Models. The Earth's field and its secular change for the International Geomagnetic Reference Field are modeled to a degree and order 8 and stored in a subroutine as a set of coefficients that can be called by programs for computing residual intensity, plotting contours of the field intensity, or direction. The American World Chart is modeled by spherical harmonic analysis of observed data to a degree and order 12 and can be used for similar applications. All digital data banks

can be recalled and processed to provide spline interpolated values on a grid that can be used as a detailed "model" of the field for specified areas.

Data Reduction Facilities. All data are processed on the UNIVAC 1108 in Suitland through a DCT 2000 facility in the Magnetism Division at the NAVOCEANO Branch at NSTL, Bay St. Louis, Mississippi. Analog records are digitized on a D-MAC Pencil Follower X-Y digitizer. Data are plotted on a CalComp Plotter (Model 663 with peripheral tape deck Model 750) and/or a high speed Varian electrostatic plotter. A Tektronics Graphic Terminal Model 4015 is used for rapid display and editing of digital data. Data files and programs are retained in the tape library in Suitland and at NSTL.

APPLICATIONS

World Charting. High-level airborne survey data are used primarily to provide data to derive the Main Earth's Field Models used in production of the World Magnetic Chart series. Variation data are used for combat, nautical, and aeronautical navigation charts and for aligning military communications, radar, and NAVADS systems. Detailed magnetic variation data are required by the Strategic Air Command to correct bombing navigation systems.

Scientific/Economic. Total intensity data are used to locate major oceanic ridges, fracture zones, seamounts, sedimentary basins and other geologic features relating to navigation and acoustic problems. The data can be used through magnetic modeling and correlation techniques to determine the age of the sea floor and for other scientific investigations related to plate tectonics. It can also be used to aid in assessment of economic resources such as in oil and mineral exploration.

Equipment. In addition to acquiring environmental data, the magnetometer equipment on NAVOCEANO ships and aircraft has been used to search for sunken ships (THRESHER, SCORPION, USNS STEVENSON, MONITOR), ordnance, buoys, and aircraft by detecting the magnetic field associated with the hull or parts of the object.

PLANS FOR FUTURE

Survey Systems. A cryogenic magnetometer will be included as part of the survey equipment on the RP-3D aircraft. New magnetometer gradiometer systems will be installed on the OSP ships in 1977. Recent tests indicate that airborne gravity measurements may be feasible aboard the Project MAGNET aircraft.

Surveys. Detailed Magnetic Anomaly Operational Effectiveness (MOE) chart airborne surveys are planned for an area in the Atlantic Ocean southwest of Bermuda and in the western Pacific Ocean, Philippine Sea

area. Shipboard surveys will continue in the OSP requirement areas of the Atlantic and Pacific Oceans and underway magnetic data from the oceanographic survey ships will be added to the data banks. High-level airborne world-charting surveys will be conducted one quarter of each year, concentrating on poorly surveyed areas of the South Pacific Ocean.

Data Reduction. Refining and consolidating computer programs to reduce the time required for data reduction and to standardize data formats will continue. New programs will be written or adapted for advanced data analyses, including upward and downward extrapolation of the field, model studies, depth determinations, magnetization computations, filtering, etc. New solid-state digitizing equipment is on order, which should allow more rapid reduction of the analog data backlog. More data in DoD Data Library Banks will be converted to standard digital format to permit rapid retrieval and greater utility.

NAVOCEANO
DATA FILE SUMMARY

CODE: 34322

DATE January 1977

TITLE: RANDOM MAGNETICS

DESCRIPTION OF DATA: Continuous Observed Total Magnetic Intensity is recorded in analog chart form. Data are also digitally sampled every 10 seconds and averaged to provide 1-minute values of observed and residual magnetics.

DATA FORMAT: Analog record and digital data on magnetic tape.

UNITS: Gammas

ACCURACY/PRECISION: ± 1.0 gamma

SAMPLING INTERVAL: 1 minute

EXTENT OF COVERAGE: 134,095 miles of track

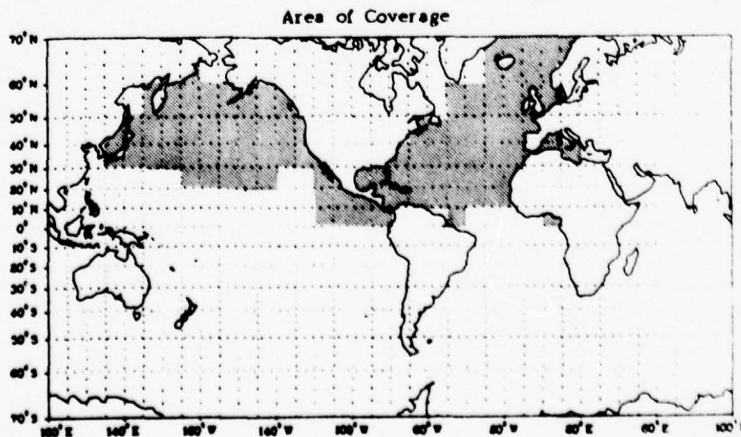
PERIOD OF COVERAGE: 1971-1976

REPOSITORY: Code 34322

AREA OF COVERAGE: N. Hemisphere

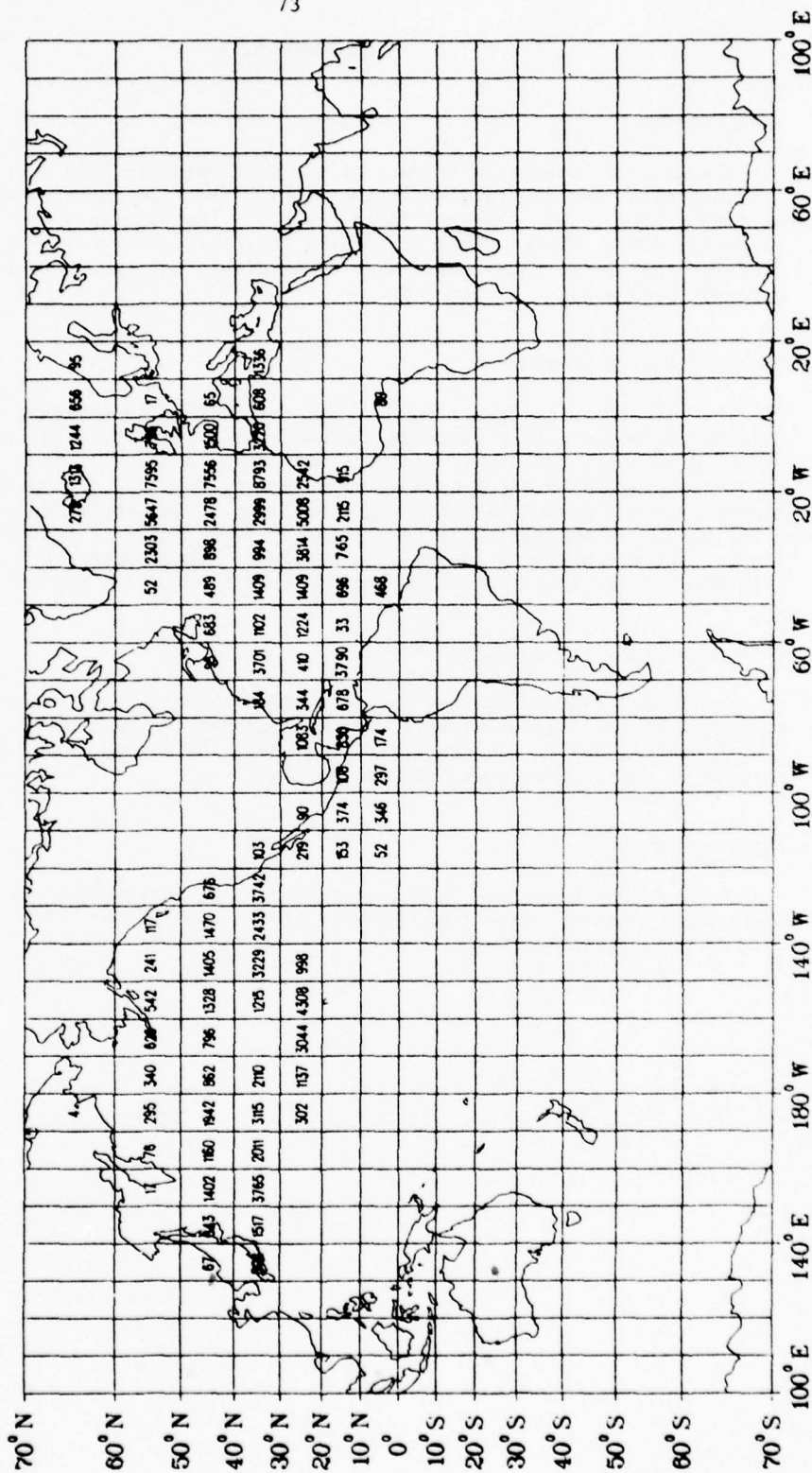
CUSTODIAN: *Frank N. Waits (601) 688-4250*
~~J. Bell (202) 763-1022~~

BACKLOG: None



DISTRIBUTION OF RANDOM MAGNETIC DATA

By 10 Degree Squares
(134,095 Miles of Track)



UNDERWAY DATA

INTRODUCTION

The Underway Data File is part of the Oceanographic Data Acquisition System-Storage and Retrieval File (ODAS-SR). The file contains data from over 90 cruises, some pre-ODAS (prior to PDP-9 installation) and the remainder ODAS. Nineteen magnetic tapes currently comprise the file. Profiles from 14 of these tapes have been edited, but the corrections have not been applied to the file.

DATA COLLECTION SYSTEMS

The file contains 12-kHz narrow beam bathymetry (Some 12-kHz wide beam data may be present to fill voids created by equipment or other problems.), observed magnetic intensity, residual magnetics, and sea surface temperature. Data from pre-ODAS cruises consist of selected, 5-minute data points from analog traces supplemented with highs and lows. ODAS cruise data on the other hand, are automatically sampled every 10 seconds via readouts from sensors and are averaged to one-minute values. These data are then merged with one-minute, interpolated geographic positions onto a magnetic tape.

DATA SCOPE AND FILE CHARACTERISTICS

The merged tape is entered into the Underway Data File. Each entry updates a master directory, which can be searched for data by ship name, cruise number, Julian day, date/time, or area. Retrieved data can be entered on magnetic tape or printed out.

FUTURE PLANS

The Underway Data File is being compressed to facilitate handling ease and lessen computer usage time, thereby aiding user access. The compressed file is called SAGEBATE.

NAVOCEANO
DATA FILE SUMMARY

CODE: **34213**
~~34222~~

DATE **October 1978**
~~January 1977~~

TITLE: SHALLOW-WATER STILL PHOTOGRAPHS

DESCRIPTION OF DATA: 35-mm and 70-mm photographs, mostly color transparencies taken with diver-operated cameras. Photos are taken to document biological conditions in connection with environmental studies.

DATA FORMAT: Slides, prints, negatives

UNITS: Individual photos

ACCURACY/PRECISION: Not applicable.

SAMPLING INTERVAL: Variable according to application.

EXTENT OF COVERAGE: **11,250**
~~10,060~~ photographs

PERIOD OF COVERAGE: 1968 - **1978**
~~1976~~

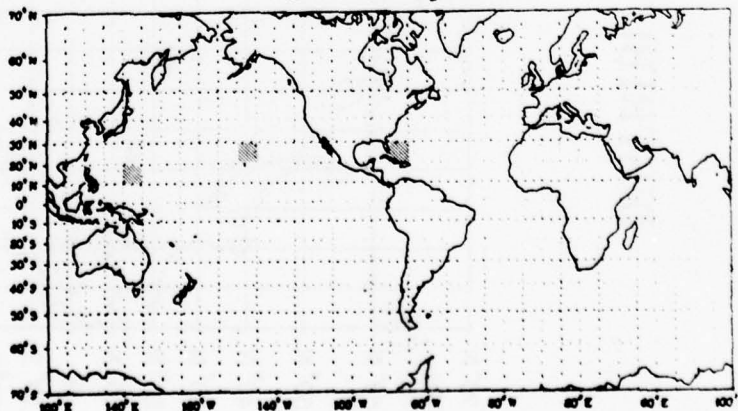
REPOSITORY: Code **34213**
~~34222~~

AREA OF COVERAGE: Bahamas, Hawaii, Guam

CUSTODIAN: H. D. Huddell (AUTOVON) 485-4110

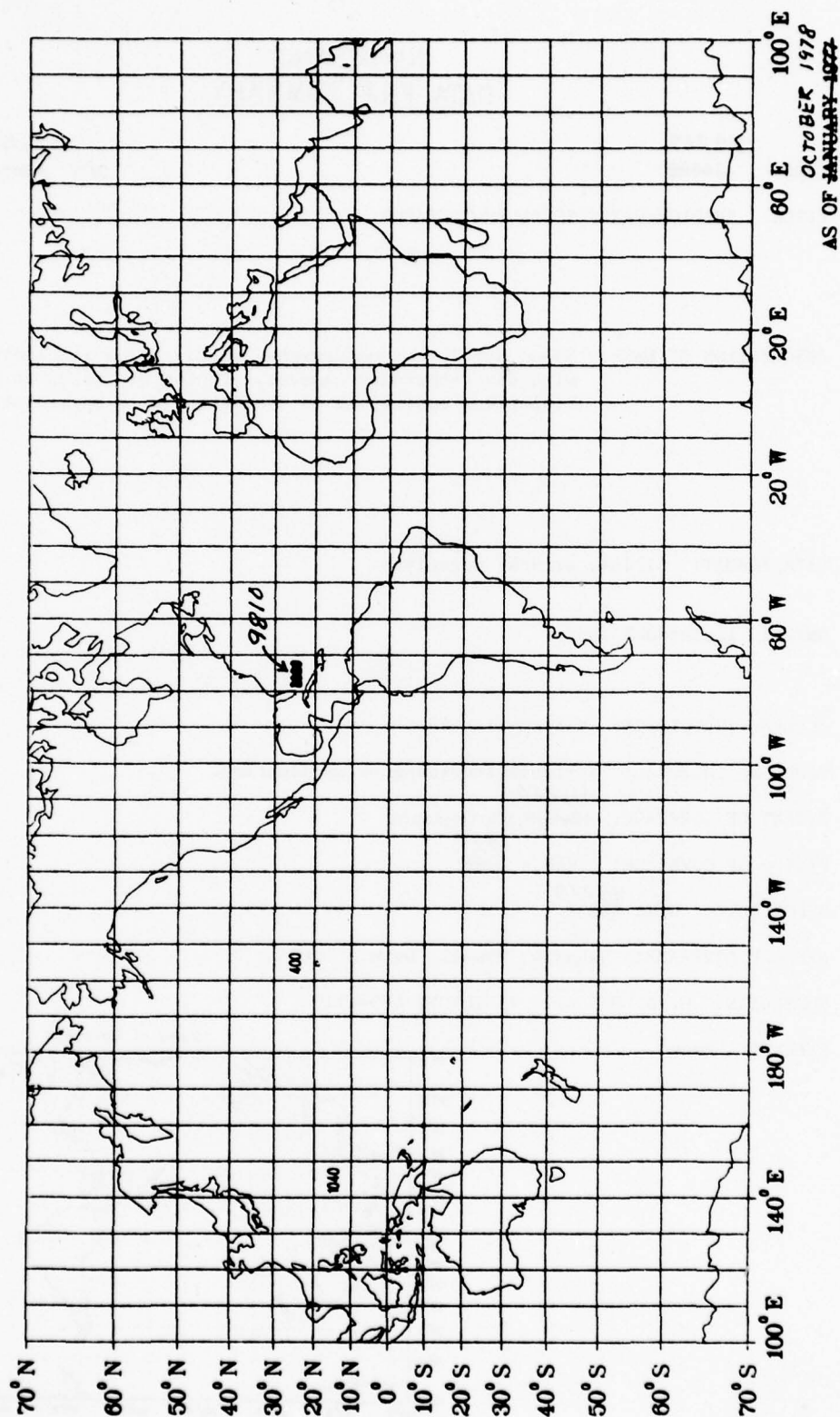
BACKLOG: None

Area of Coverage



DISTRIBUTION OF SHALLOW WATER PHOTOGRAPHY

By 10 Degree Squares
(10,060 Photos)



SHALLOW-WATER STILL PHOTOGRAPHS

INTRODUCTION

Photographs are taken to document underwater biological conditions in coral reef areas. The majority of the photos are 35-mm color slides and 70-mm transparencies. Photos are filed by date of survey and each photo is logged as to location, film type, and camera.

DATA COLLECTION SYSTEMS

Principal equipment is the Nikonos underwater camera with 28-mm, 35-mm, and 120-mm lenses. In water deeper than 10 feet 150 watt-second strobes are used to provide a source of light. A number of close-up attachments are also used with the Nikonos for documentation of small individual organisms. A Rolleiflex camera mounted in a Rolleimarine underwater case is used where the 70-mm square format is desired. The photographer logs each photograph on a plastic sheet, which becomes a part of the permanent record.

DATA SCOPE AND FILE CHARACTERISTICS

Photos are catalogued and filed by survey.

APPLICATIONS

Photos are taken to document biological conditions in coral reef areas and changes in these conditions.

PLANS FOR THE FUTURE

No changes in present method of operation or data filing system are anticipated.

NAVOCEANO
DATA FILE SUMMARY

CODE: 34211

DATE January 1977

TITLE: COASTAL UNDERWATER PHOTOGRAPHY

DESCRIPTION OF DATA: Rolls of 35-mm black and white film, varying in length from 50 to 150 feet. Film may have up to 700 exposures per roll.

DATA FORMAT: 35-mm film, (2 1/4" x 1 1/8".)

UNITS: Film frames

ACCURACY/PRECISION: Not applicable

SAMPLING INTERVAL: From 12 seconds to several minutes.

EXTENT OF COVERAGE: 126 camera runs.

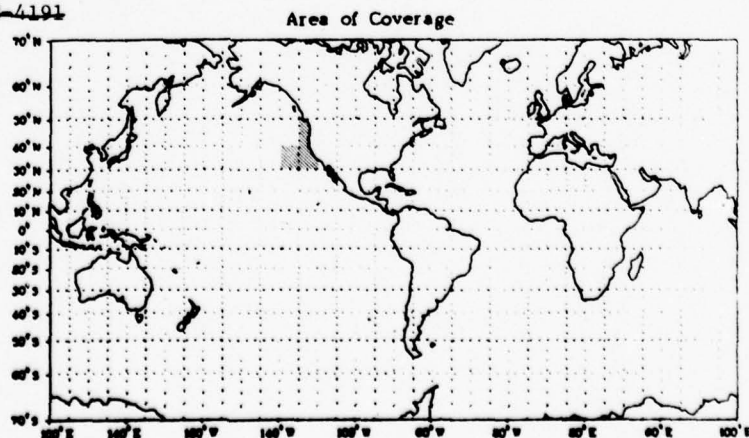
PERIOD OF COVERAGE: 1970 - 1976

REPOSITORY: Code 34211

AREA OF COVERAGE: Coastal U.S.

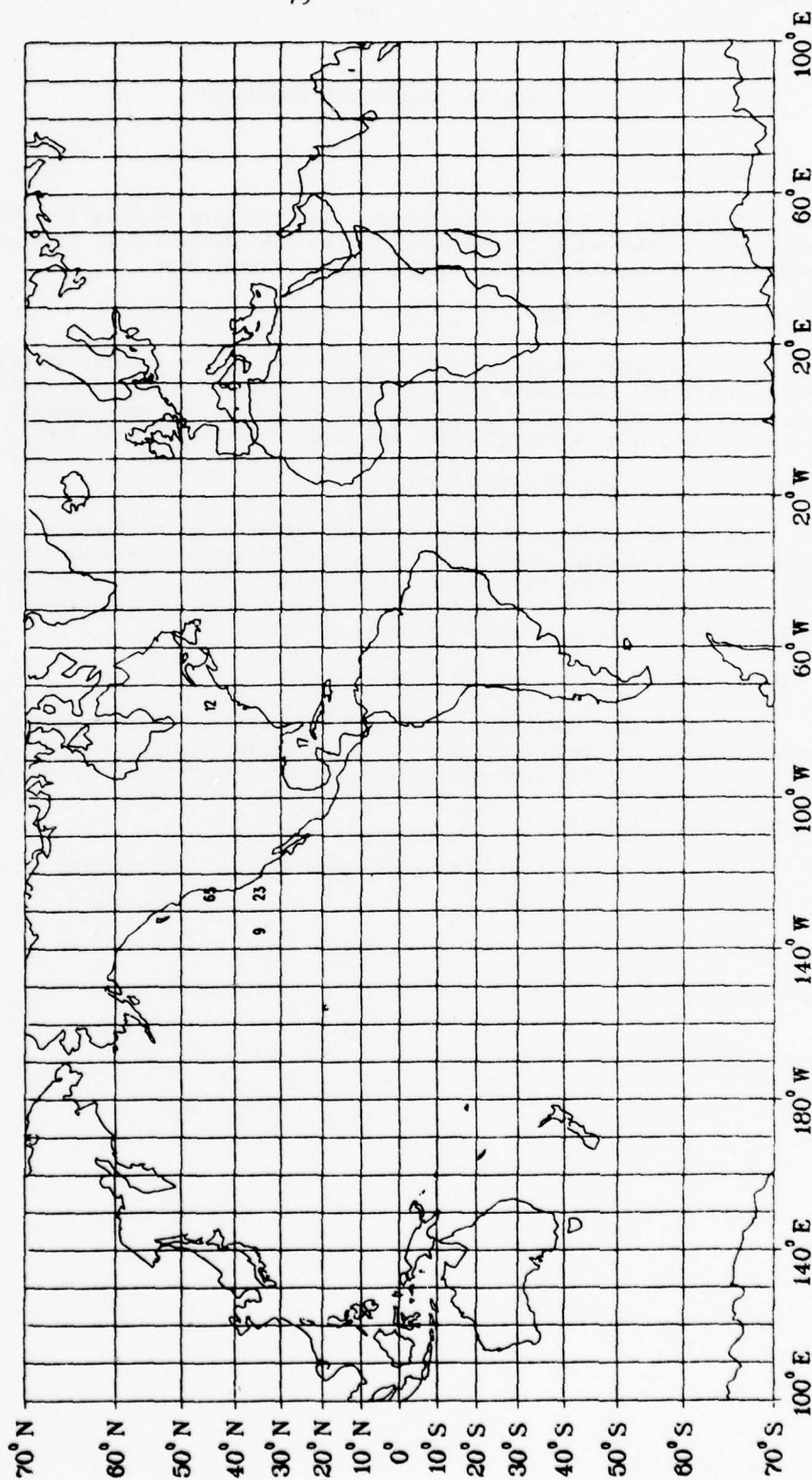
CUSTODIAN: J. Pollio (601) 688-4524

BACKLOG: None



DISTRIBUTION OF COASTAL UNDERWATER PHOTOGRAPHY

By 10 Degree Squares
(126 Camera Runs)



AS OF JANUARY 1977

COASTAL UNDERWATER PHOTOGRAPHY

INTRODUCTION

The Coastal Underwater Photography File consists of over 100,000 exposures of the ocean bottom taken during 126 camera runs. Coverage is primarily of the U.S. Pacific and Atlantic Coastal Zone.

DATA COLLECTION SYSTEMS

The underwater camera used is a 35-mm EG&G stereo underwater system. Photo pairs are taken with the camera axes oriented vertically and at a prefixed separation, with a light source of 250 to 500 watt/seconds illumination. The average height from the ocean floor is 15 feet.

DATA SCOPE AND FILE CHARACTERISTICS

The 35-mm roll film is inspected for satisfactory processing, correct identification, data imagery, and signs of instrument performance during the camera run. Each bottom photograph is analyzed, evaluated, and placed in the file of its survey operation. Selected photographs together with the results of the evaluation are published.

APPLICATION

The underwater photographs are used primarily as a base reference of the environmental condition of the bottom. If there is a resurvey of an area, the records are compared to show possible environmental bottom changes.

PLANS FOR THE FUTURE

No changes in present methods of operation are anticipated.

NAVOCEANO
DATA FILE SUMMARY

CODE: **34213**
~~34222~~

DATE **October 1978**
~~January 1977~~

TITLE: SHALLOW-WATER CINE FILM

DESCRIPTION OF DATA: 16-mm Color Movie Film

DATA FORMAT: Rolls of film

UNITS: Linear feet

ACCURACY/PRECISION: Not applicable.

SAMPLING INTERVAL: Representative section along track.

EXTENT OF COVERAGE: 5,000 feet of film.

PERIOD OF COVERAGE: 1967 - 1974

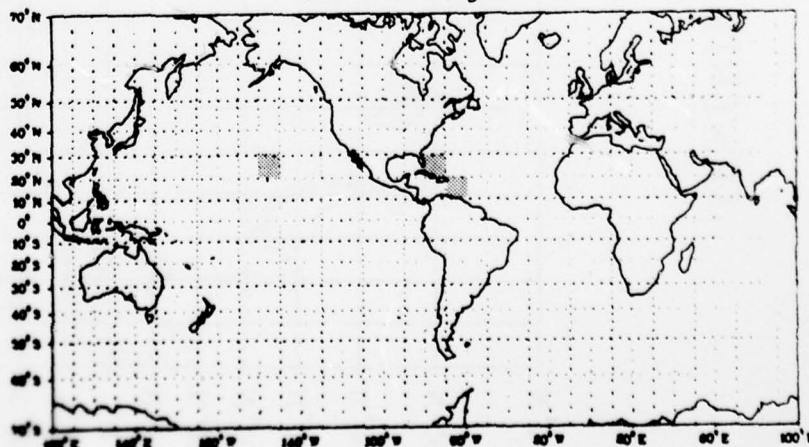
REPOSITORY: Code **34213**
~~34222~~

AREA OF COVERAGE: Bahamas, Vieques, Hawaii

CUSTODIAN: H. D. Huddell (AUTOVON) 485-4110

BACKLOG: None

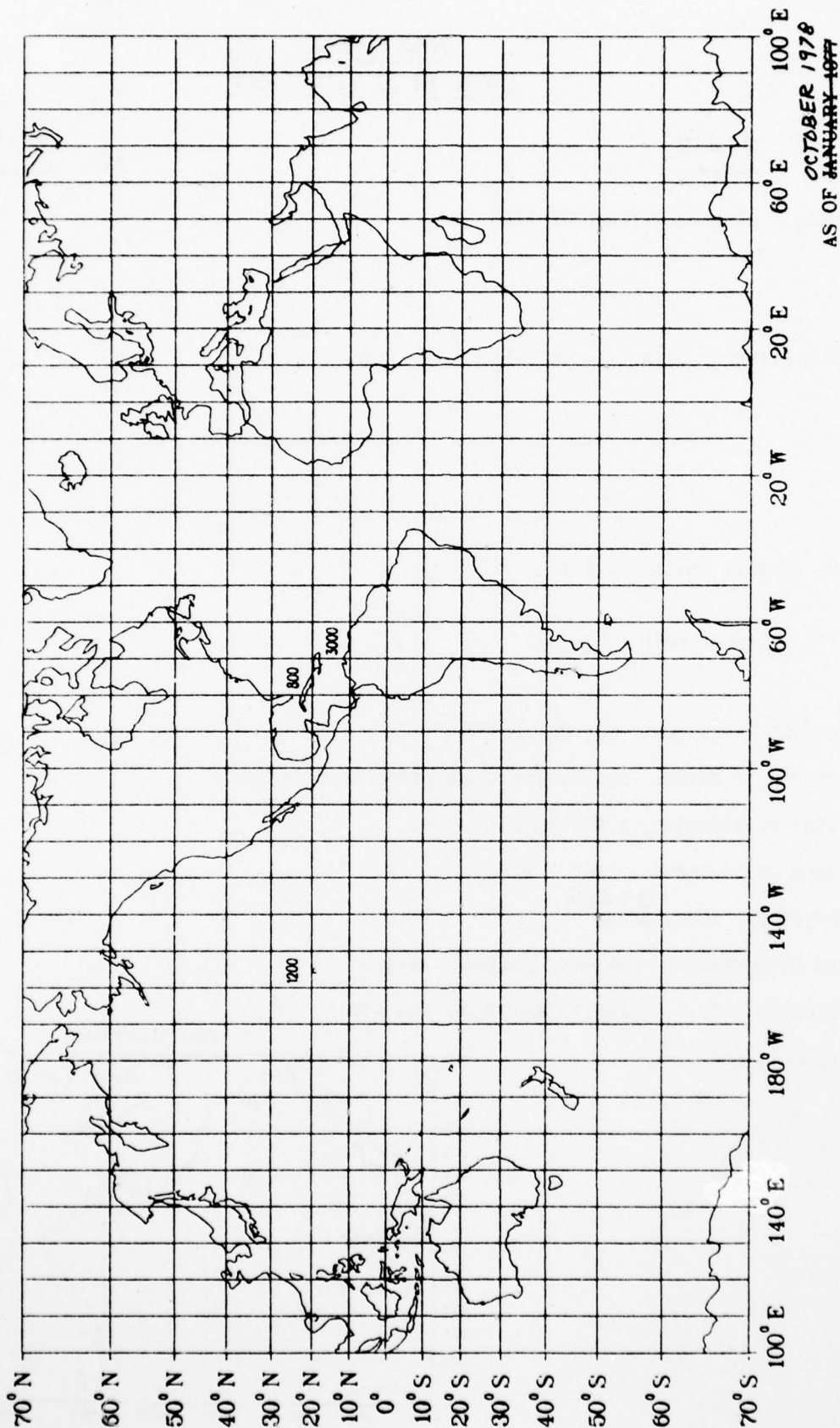
Area of Coverage



DISTRIBUTION OF SHALLOW WATER CINE FILM

By 10 Degree Squares

(5,000 Feet of Film x100)



SHALLOW-WATER CINE FILM

INTRODUCTION

Underwater movies are taken to document underwater conditions for environmental impact studies and cable route surveys. Data are in the form of 16-mm color film in 200-foot and 400-foot projection reels. Only some reels have been edited.

DATA COLLECTION SYSTEMS

Hand-held Milliken DBM-9 cameras are used. No lights are used so quality footage usually is only possible in water less than 60 feet deep. However, in extremely clear water, good quality film is recorded at depths of 130 feet. The DBM-9 camera holds a 400-foot magazine and operates on an internal rechargeable battery.

DATA SCOPE AND FILE CHARACTERISTICS

Film reels are catalogued and filed by survey.

APPLICATIONS

Films are used for documentation of bottom types and biological conditions in environmental study areas and along cable routes.

PLANS FOR THE FUTURE

No changes in method of operation or data filing are anticipated.

NAVOCEANO
DATA FILE SUMMARY

CODE: 34322

DATE January 1977

TITLE: BOTTOM PHOTOGRAPHY

DESCRIPTION OF DATA: Bottom photographs, prints and negatives taken with several types of cameras at various depths. A large portion of the holding consists of 35-mm negatives.

DATA FORMAT: 8" x 10" and 3" x 5" prints and negatives, 35-mm negatives, and other miscellaneous sizes of prints.

UNITS: Not applicable

ACCURACY/PRECISION: Not applicable.

SAMPLING INTERVAL: Random

EXTENT OF COVERAGE: 125,000 Photographs

PERIOD OF COVERAGE: 1950 - 1975

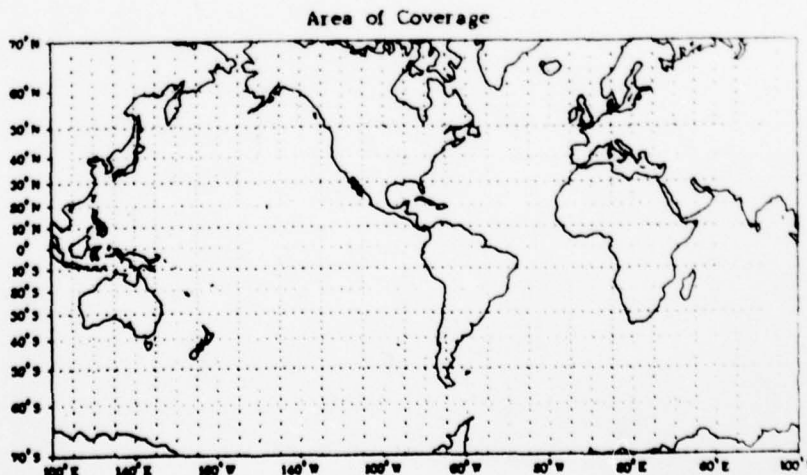
REPOSITORY: Code 34322

AREA OF COVERAGE: Worldwide (See note below.)

CUSTODIAN: *Bart Keville (601) 688-4242*
~~J. Dail (202) 762-1022~~

BACKLOG: 40,000 Photographs

NOTE: This chart represents only a small percentage of the locations of the photo file (no 35mm negatives locations have been shown).



DISTRIBUTION CHART

NOT YET AVAILABLE

BOTTOM PHOTOGRAPHY

INTRODUCTION

The sea bottom photography file consists of approximately 125,000 photographs collected by the Naval Oceanographic Office and other Oceanographic Institutions. Coverage is worldwide, but primarily of the North Atlantic and North Pacific.

DATA COLLECTION SYSTEMS

The file contains bottom photos in various sizes (3" x 5", 5" x 7", and 8" x 10" prints and negatives, and 35-mm negative). These photographs taken with several types of cameras, and the quality, though generally good, varies.

DATA SCOPE AND FILE CHARACTERISTIC

Photographs, other than the 35-mm size, are filed by Marsden Squares. The 35-mm negatives are not yet easily accessible.

FUTURE PLANS

The 35-mm negative holdings will be catalogued and filed by Marsden Square. Additional photographs will be added to the files as they become available.

NAVOCEANO
DATA FILE SUMMARY

CODE: 3710

DATE January 1977

TITLE: SEA ICE

DESCRIPTION OF DATA: Aerial, ship, and land station observation of positions of ice edges, ice concentration, floe size, age, ridge heights, water openings, and orientation.

DATA FORMAT: Digital card images. Individual observations can be retrieved by date and geographic area. Data from ice reports are in chart form and coded WMO format. Data on microfilm are recorded on 35-mm aperture cards.

UNITS: Standard WMO ice reporting format for aerial observations. Land station data given in days, months, years; thickness in meters.

ACCURACY/PRECISION: Thickness to nearest cm.

SAMPLING INTERVAL: Aerial reconnaissance and ship observations - random; satellite - daily; land stations - daily.

EXTENT OF COVERAGE: 53,046 Observations. 1200 Ice distribution charts.

PERIOD OF COVERAGE: Reports 1952-1971; digital data 1964-1971 (1972 present being processed); microfilm ice analysis chart files - 1969-1976.

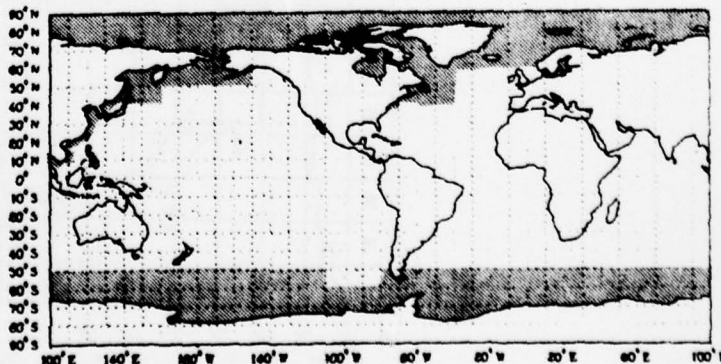
REPOSITORY: Code 3710 and Code 5400 (magnetic tape library).

AREA OF COVERAGE: North and south polar region.

CUSTODIAN: *Cyrus G. Rhode, Jr. (601) 688-4480*
~~D. Corcoran (202) 763-2354~~

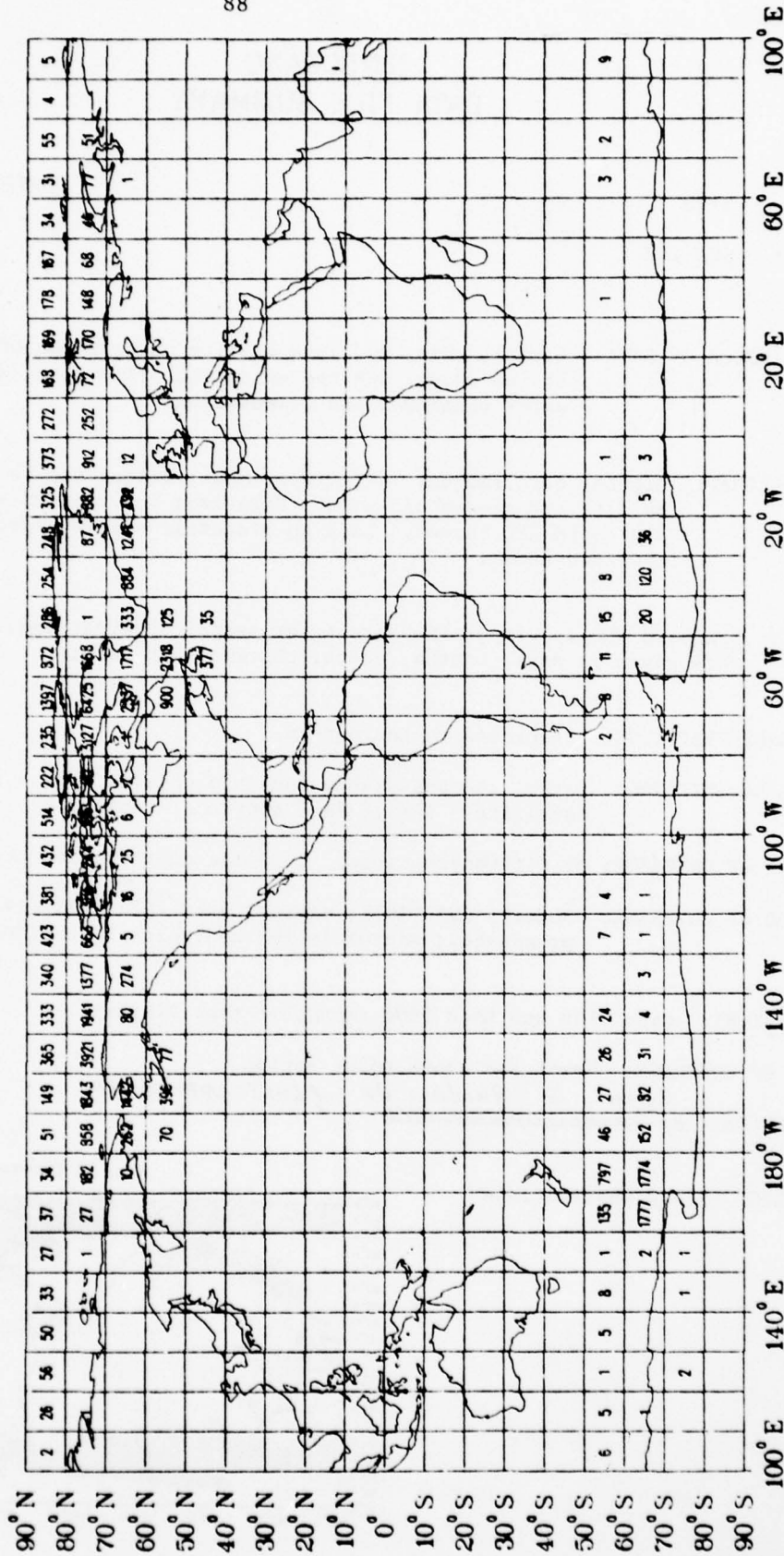
BACKLOG: 8,000 Observations

Area of Coverage



DISTRIBUTION OF SEA ICE DATA

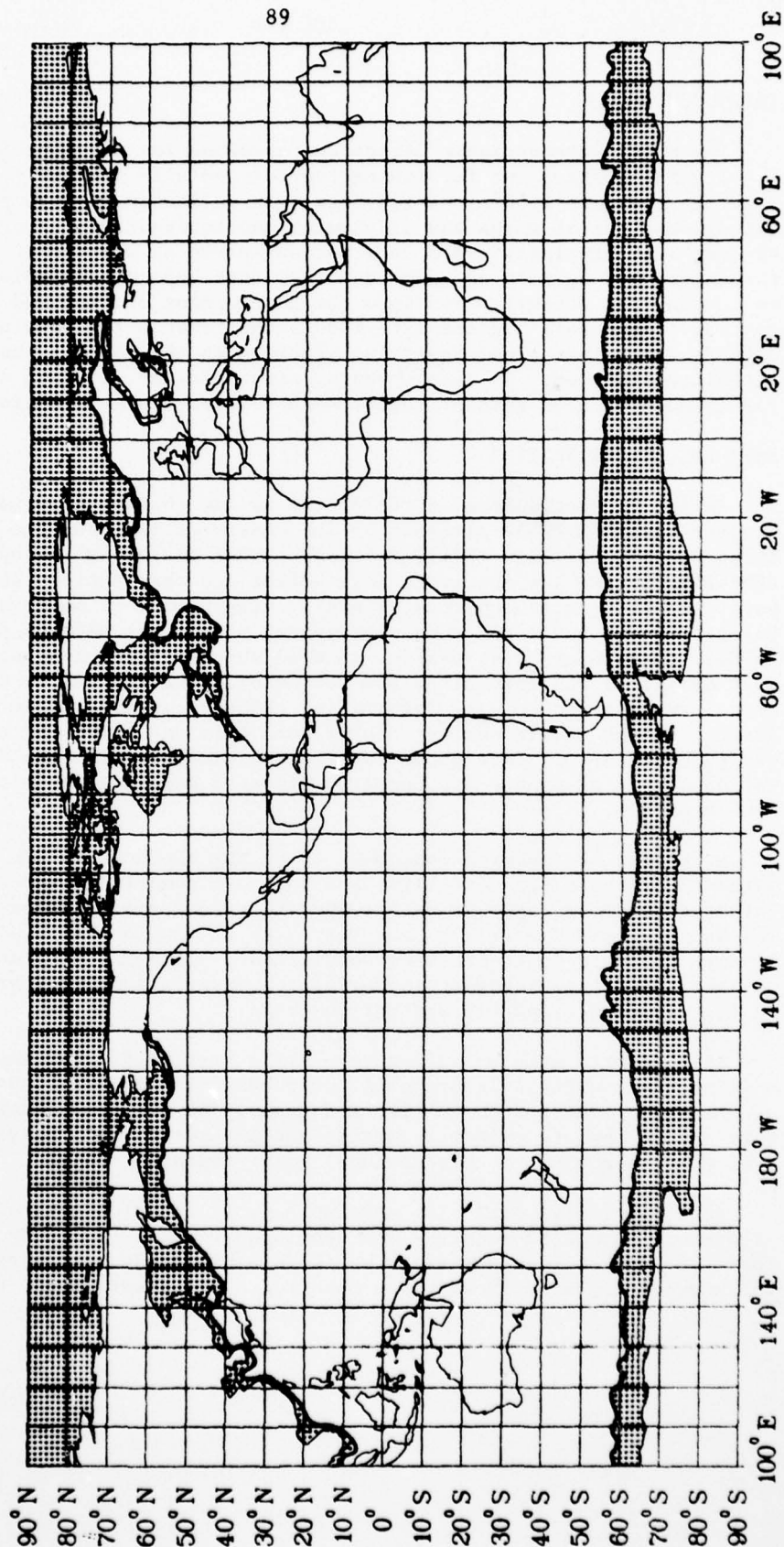
By 10 Degree Squares
(53,046 Observations)



AS OF JANUARY 1977

DISTRIBUTION OF SEA ICE DATA

By 10 Degree Squares
(ANALYSED CHART COVERAGE)



AS OF JANUARY 1977

SEA ICE

INTRODUCTION

The Naval Oceanographic Office was assigned the mission of obtaining sea-ice information and furnishing ice forecasts in the early 1950's. Prior to the late 1960's sea-ice data were collected in both polar regions through the use of ships and fixed-wing and rotor-driven aircraft, as well as from land stations. This information served as the source input for ice forecasts, but as more and more detailed data became available it also served to further the investigation into the development of improved and new forecasting techniques. In the late 1960's the reasons for obtaining sea-ice data remained, but a new observing platform in the form of the earth-orbiting satellite appeared. In recent years, strategic and economic needs have resulted in an even greater requirement for sea-ice information.

DATA COLLECTION SYSTEMS

Aerial reconnaissance in the Arctic is now conducted primarily aboard the Project BIRDSEYE RP-3A aircraft by ice observers from the Ice Department, Fleet Weather Facility (FWF), Suitland. When operating in support of operation DEEP FREEZE, FWF ice observers make aerial ice observations aboard transiting naval aircraft on an opportunity basis. The number of observations made from helicopters is small and consists generally of those made by personnel assigned to U.S. Coast Guard icebreakers. Aerial observations at present offer the most detail to the forecaster and scientist; however, due to the nature of aerial reconnaissance, ice information gathered in this manner will have limited extent and is scattered over both time and space for a specific geographical area. Data gathered by reconnaissance missions flown by other nations, such as Canada and Denmark, are also made available to U.S. Government agencies.

Satellite ice observations make up by far the bulk of ice data now being gathered by the Navy. Satellite ice data are compiled utilizing imagery gathered by microwave radiometers and the visual and infrared imagery from the Scanning Radiometer (SR) and Very High Resolution Radiometer (VHRR) sensors on board Earth-orbiting satellites. Although these data do not possess the detail inherent in aerial ice observation, they provide global, daily, day/night, and all weather coverage.

Ship reports make up only a very small portion of the sea-ice data obtained. As with aerial reports, ship observations are both detailed and at the same time limited in time and space. Ships participating in sea-ice data collection are primarily Arctic and Antarctic resupply vessels and their icebreaker escorts, or an occasional polar research vessel.

Land station reports also make up a small fraction of observed ice data. At present NAVOCEANO receives ice condition reports from only two stations in the western Arctic on a regular basis, but has in its files estimated ice thicknesses for some 60 stations based on their observed air temperatures.

DATA REDUCTION AND FILES

Data Reduction. Sea-ice information is generally received from aerial reconnaissance missions, ships, or land stations via coded message. FWF ice analysts plot the ice data on charts according to World Meteorological Organization terminology. These analysts also interpret and plot daily ice-condition data for the Arctic and the Antarctic regions from satellite imagery. These daily satellite data are then compiled over a 7-day period and disseminated on a weekly chart. Between 1952 and 1971 for the Arctic and between 1962 and 1969 for the Antarctic, NAVOCEANO through its annual reports of both the Arctic and Antarctic ice observing and forecasting programs, provided in chart form ice conditions observed by aerial reconnaissance and interpreted from satellite imagery for the eastern and western sectors of the North American Arctic and in selected portions of the seas surrounding the Antarctic Continent. These series of annual reports were terminated in 1969 for the Antarctic and in 1971 for the Arctic. A microfilm file of all chart analyses of aerial ice reconnaissance and satellite ice information compiled by FWF, Suitland has been established by NAVOCEANO. Duplicate or hard copies of the microfilm imagery are made available at cost to all interested parties and agencies. NAVOCEANO has published 72 BIRDSEYE reports detailing the low-altitude Arctic aerial ice reconnaissance missions flown between 1962 and 1971. These reports contain both plotted ice-condition analyses and the raw ice data recorded in numerical WMO coded format. All spot observations gathered on BIRDSEYE missions and other aerial reconnaissance flights between 1964 and 1971 have been placed on magnetic tape. At present, all spot observations taken subsequent to 1971 are in the process of being placed on tape.

APPLICATIONS

Basic Research. The responsibility for continued basic research supporting the prediction of sea-ice dynamic parameters and processes required for the development of basic ice forecasting techniques has been assigned to the Naval Ocean Research and Development Activity (NORDA). The researcher uses historical ice data when attempting to correlate measured meteorological and oceanographic parameters to the observed growth, decay, and movement of sea-ice. Requests for sea-ice parameters are received from government (domestic and foreign) agencies, universities, and oil companies and their consultants.

Operational. FWF, Suitland is tasked to provide trained aerial ice observers and ice forecasting services for all DoD and other approved agencies. Synoptic ice information is a necessary and basic input to a successful ice forecast. A historical data base is also needed for the thorough preoperational planning of any polar exercise or program.

Fleet Applications. NAVOCEANO requires an extensive file of historical aerial reconnaissance and satellite ice data if it is to perform the following tasks:

1. Explore new applications of ice analyses and forecasts to Fleet operations.
2. Revise and update ice forecasting techniques.

3. Prepare special studies relating ice conditions to operational performance.
4. Prepare ice atlases.
5. Develop and maintain an ice data bank.

PLANS FOR THE FUTURE

Files. NAVOCEANO will continue to maintain its aerial ice reconnaissance and satellite ice information microfilm file.

Data Bank. NAVOCEANO believes that the development of an ice data bank to be used to support Fleet requirements for forecasting and analysis is desirable. The sources for such a data bank would include: (1) direct ice observations from satellite, aircraft, ship, and shore platforms, and (2) chart analyses of regional ice conditions similar to those prepared by FWF and NAVOCEANO. Data output from such a data bank should be available in a direct measurement format for specific regions and also in a digital grid map format.

NAVOCEANO
DATA FILE SUMMARY

CODE: 34322

DATE January 1977

TITLE: BOTTOM SEDIMENT

DESCRIPTION OF DATA: Bottom sediment data, consisting of grain size, organic genetic composition, and inorganic genetic composition.

DATA FORMAT: Digital, card image.

UNITS: Bottom sediment types.

ACCURACY/PRECISION: Varies with sample interval.

SAMPLING INTERVAL: Random samples; the greatest coverage is near ports and well-traveled routes.

EXTENT OF COVERAGE: 113,571 Observations

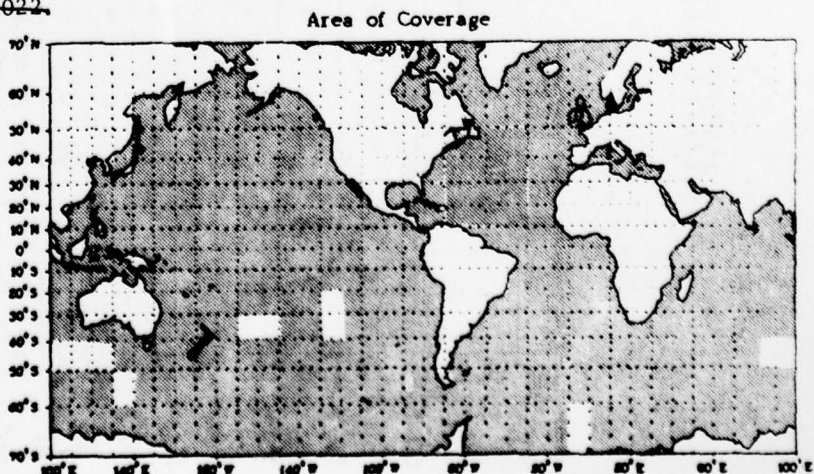
PERIOD OF COVERAGE: 1850-1977

REPOSITORY: Magnetic tape library (Code 5400).

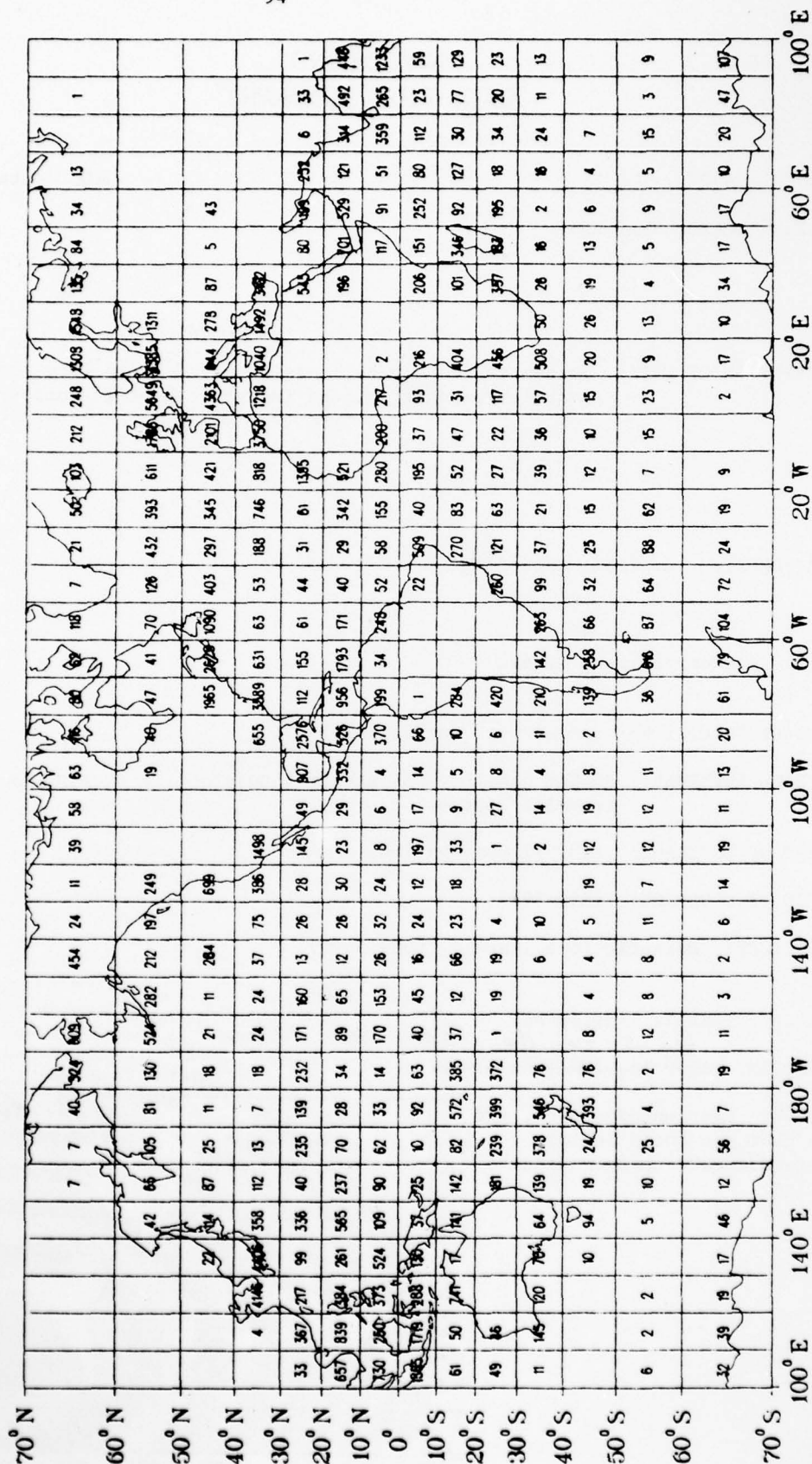
AREA OF COVERAGE: Worldwide.

CUSTODIAN: *Bart Keville (601) 688-4242*
~~J. Dail, (202) 763-1022~~

BACKLOG: Past uncoded data, and data that are found in the literature make up an extensive backlog.



By 10 Degree Squares
(113, 571 Observations)



AS OF JANUARY 1977

AD-A066 255

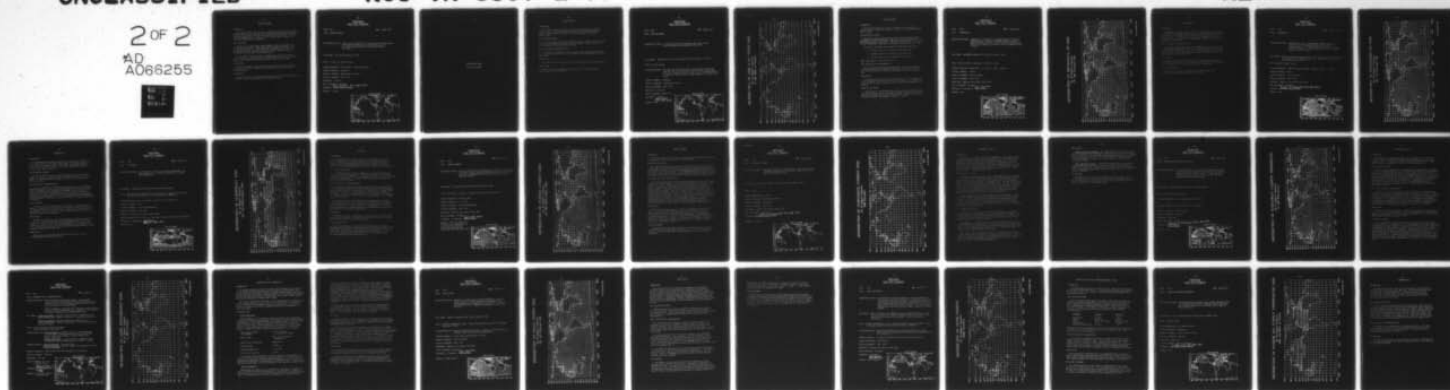
NAVAL OCEANOGRAPHIC OFFICE NSTL STATION MS
NAVAL OCEANOGRAPHIC OFFICE DATA FILE SUMMARY, (U)
JAN 77 J C WILKERSON
N00-TN-3007-1-77

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2 OF 2
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A066255



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DATE
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DDC

BOTTOM SEDIMENT

INTRODUCTION

The Bottom Sediment file consists of information gathered from sediment analysis reports, from notations and accompanying documentation on sediments in the open literature, and from annotations on nautical charts. The file contains information on (1) grain size, (2) organic genetic composition, (3) and inorganic genetic composition.

DATA COLLECTION

The data are collected from Bottom Sediment Files and from published and unpublished reports. These include bottom sediment information from professional publications, from unpublished information within the Naval Oceanographic Office, and from foreign and domestic nautical charts. As of January 1977 there were 113,571 observations.

The original field data consist of samples from lead lines, dredges, cores, and grabs. Additional data have been added to the file from divers' reports, deep submersible vehicle reports, and from nautical charts.

APPLICATIONS

The Bottom Sediment file yields basic information on bottom composition to satisfy a variety of requests for information from both internal and external sources.

FUTURE PLANS

Future plans are to continue to add more data to the files from the open literature and from foreign and domestic nautical charts.

NAVOCEANO
DATA FILE SUMMARY

CODE: 3432

DATE January 1977

TITLE: SEISMIC PROFILE

DESCRIPTION OF DATA: Seismic data collected by the Sparker System, Teledyne Model SSP operating at 90K joules at a repetition rate of 10 seconds, and recorded at 4-second and 10-second scan rates.

DATA FORMAT: Microfilm and analog records.

UNITS: 4-second and 10-second scan.

ACCURACY/PRECISION: 0.01 seconds. (scaling accuracy)

SAMPLING INTERVAL: Continuous

EXTENT OF COVERAGE: 500,000 miles of track

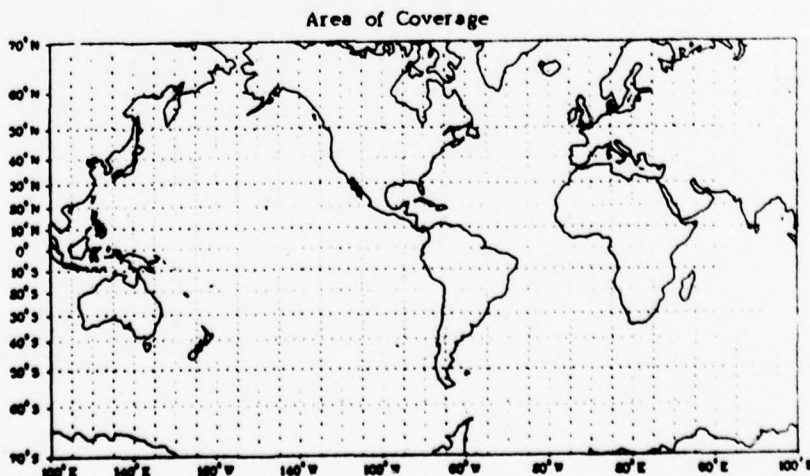
PERIOD OF COVERAGE: 1965 - 1977

REPOSITORY: Code 3432

AREA OF COVERAGE: Worldwide

CUSTODIAN: *Bart Keville (601) 688-4242*
~~J. Dail (202) 763-1022~~

BACKLOG: 2 Cruises



DISTRIBUTION CHART

NOT YET AVAILABLE

SEISMIC PROFILE

INTRODUCTION

The seismic profile file consists of data from approximately 500,000 nautical miles of survey operations conducted by the Naval Oceanographic Office. Data coverage is primarily of the North Atlantic and North Pacific Oceans.

DATA COLLECTION SYSTEM

The file contains seismic data collected from the Sparker system, Teledyne Model SSP and recorded on Raytheon precision seismic recorders, one set for 4-second scan and one for 10-second scan.

DATA SCOPE AND FILE CHARACTERISTICS

The seismic file consists of rolls of analog data and microfilm of that data. Retrieval of the data is accomplished by cruise number and/or microfilm file number.

APPLICATIONS

The seismic data file is used either as original analog rolls or microfilm.

FUTURE PLANS

New data will be microfilmed and catalogued as it becomes available through future survey operations.

NAVOCEANO
DATA FILE SUMMARY

CODE: 34211

DATE January 1977

TITLE: SIDE SCAN SONAR

DESCRIPTION OF DATA: A continuous recording containing a dual trace bottom echo and indexed by lane width and time marks.

DATA FORMAT: Analog trace 11 or 24 inches wide; various lengths to 300 feet.

UNITS: Meters, seconds

ACCURACY/PRECISION: The record may have three range scales and paper speeds; (1) 75-meter scale for 10 seconds at 100 lines/inch, (2) 150-meter scale for 5 seconds at 150 lines/inch, and (3) 300-meter scale for 2.5 seconds at 200 lines/inch. Range resolution is 1/250 of full scale.

SAMPLING INTERVAL: Continuous

EXTENT OF COVERAGE: 1,680 Miles of Track

PERIOD OF COVERAGE: 1970 - 1976

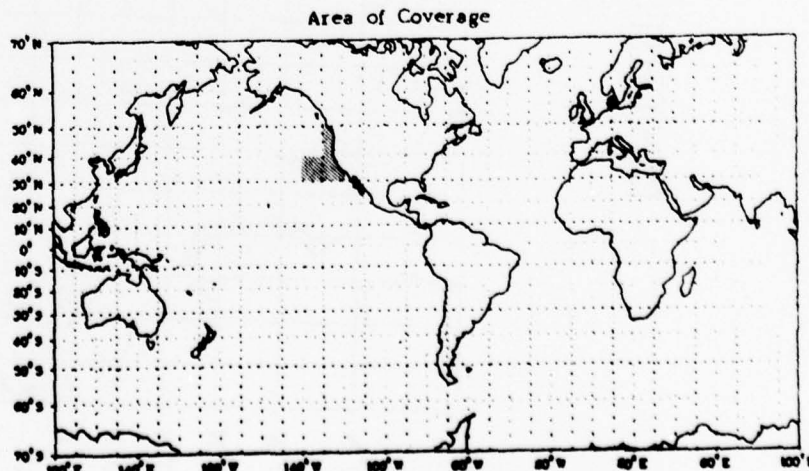
REPOSITORY: Code 34211

AREA OF COVERAGE: Coastal U.S.

CUSTODIAN: J. Pollio

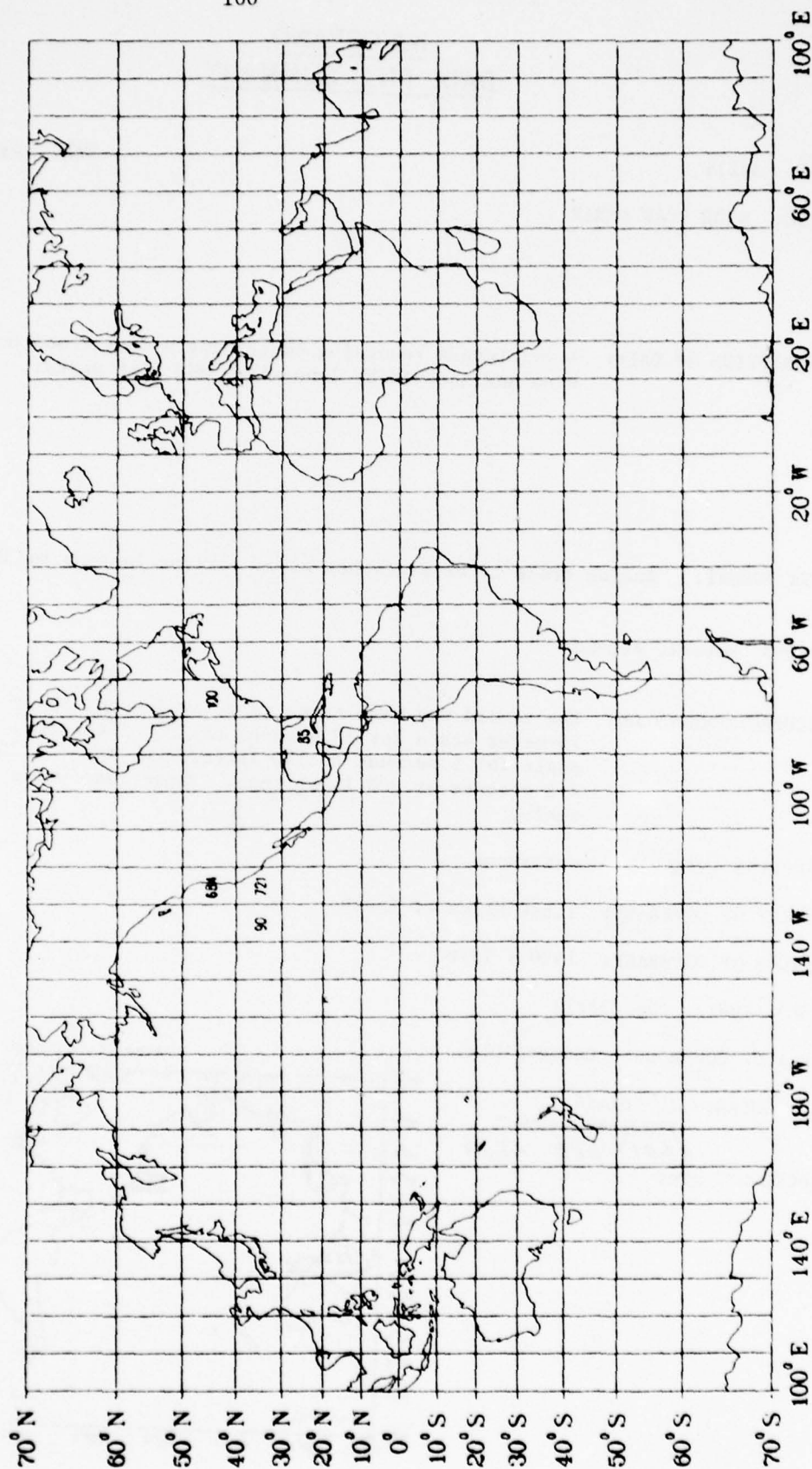
~~(202) 433-4191~~
(601) 688-4524

BACKLOG: None



DISTRIBUTION OF SIDE SCAN SONAR DATA

By 10 Degree Squares
(1,680 Miles of Track)



AS OF JANUARY 1977

SIDE SCAN SONAR

INTRODUCTION

The Side-Scan-Sonar File consists of records for 1,680 nautical miles of bottom. Coverage is primarily of the U. S. Pacific and Atlantic Coastal Zones.

DATA COLLECTION SYSTEMS

Records are collected using side-scan-sonar systems manufactured by Chesapeake Instrument Corporation, EG&G Inc., Klein Associates, and Westinghouse Electric Corporation. The record is either an 11- or 24-inch roll of treated paper that bears a permanent tracing of the sonar image.

Data may be recorded in three range scale and paper speed modes:

1. 75 meter scale for 10 seconds at 100 lines/inch.
2. 150 meter scale for 5 seconds at 150 lines/inch.
3. 300 meter scale for 2.5 seconds at 200 lines/inch.

Range resolution is 1/250 of full scale.

DATA SCOPE AND FILE CHARACTERISTICS

The side-scan-sonar record is inspected for satisfactory condition, accuracy, and quality of instrument performance over the track line. Each record is analyzed, evaluated, and placed in the survey operation file.

APPLICATION

The side-scan-sonar record is used primarily as a base reference of the environmental condition of the bottom. If there is a resurvey of an area, the records may be compared to show possible environmental bottom changes.

PLANS FOR THE FUTURE

Side-scan-sonar records presently on file will be the reference base for areas surveyed. New initial side-scan-sonar records will expand this base, while the records of the resurveys will be compared with the base records for possible environmental changes in the area.

NAVOCEANO
DATA FILE SUMMARY

CODE: 34312

DATE January 1977

TITLE: MECHANICAL BT

DESCRIPTION OF DATA: Temperature vs depth data to a maximum depth of 275 meters (usually less). Traces are etchings produced on smoked glass slides by mechanical pressure and temperature sensors. Profile is recomputed by fitting a series of regression lines to trace.

DATA FORMAT: NAVOCEANO compressed file format in geosort order.

UNITS: Depth in meters; temperature in degrees Celsius

ACCURACY/PRECISION: Temperature - $\pm 0.5^{\circ}\text{C}/\pm 0.2^{\circ}\text{C}$; Depth - $\pm 2\text{m}/\pm 1\text{m}$

SAMPLING INTERVAL: 5 meters

EXTENT OF COVERAGE: 778,610 Stations

PERIOD OF COVERAGE: 1940 - 1974

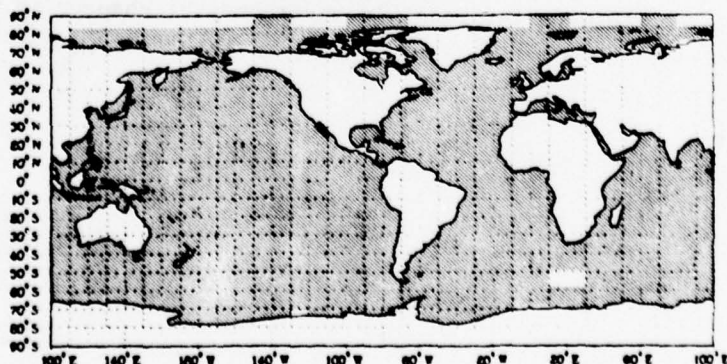
REPOSITORY: Magnetic tape library (Code 5400)

AREA OF COVERAGE: Worldwide

CUSTODIAN: R. Blumenthal (601) 688-4220
(202) 433-3257

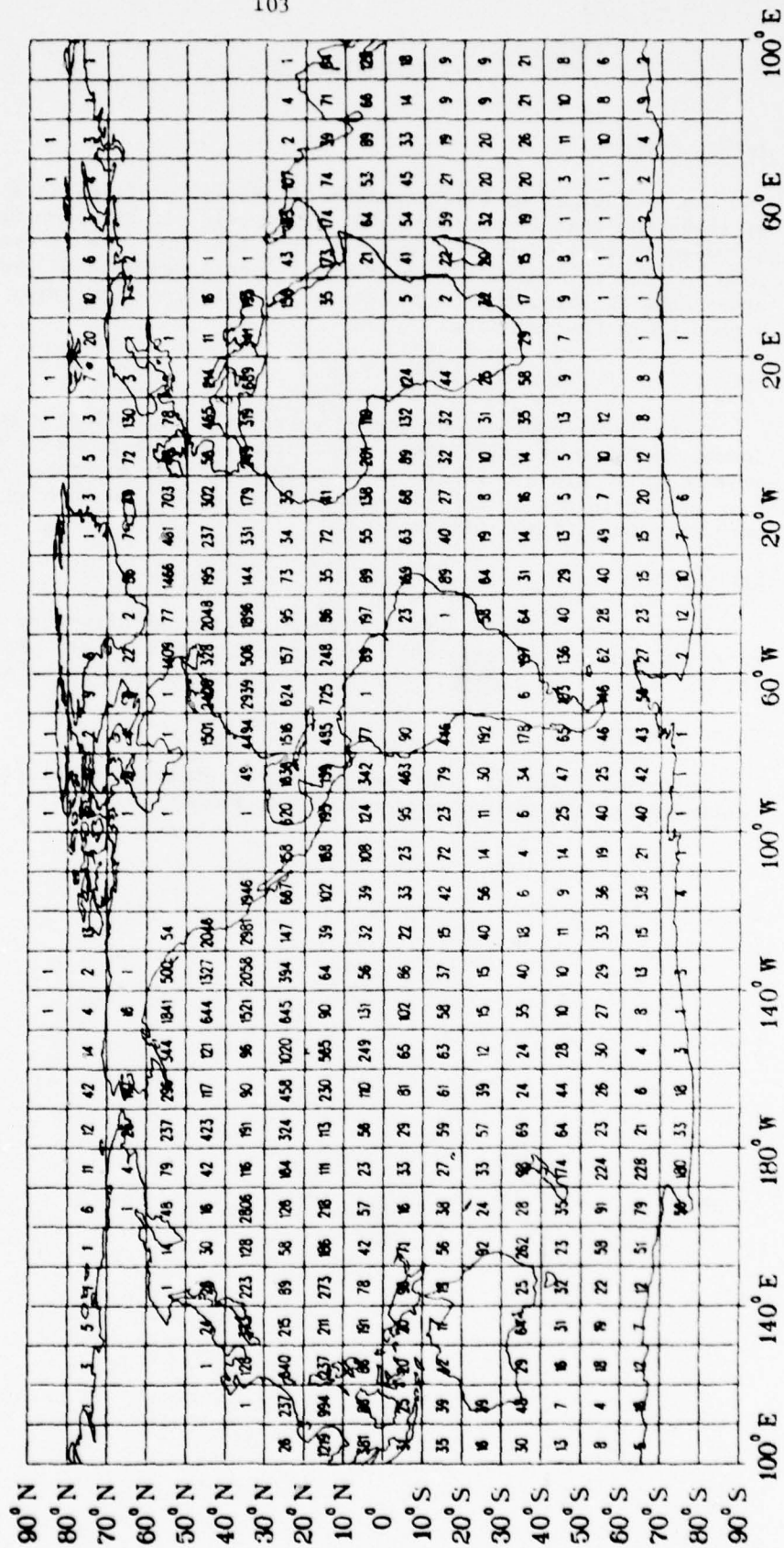
BACKLOG: None

Area of Coverage



DISTRIBUTION OF MECHANICAL BT DATA

By 10 Degree Squares
(77, 861 Stations x10)



AS OF JANUARY 1977

MECHANICAL BT

INTRODUCTION

The Mechanical BT File consists of 778,610 profiles to a maximum depth of about 900 feet (generally about 400 feet). It has been updated through 31 December 1974 with data obtained from the NODC file of domestic and foreign sources. Although the data are not considered as precise as the expendable BT data, they have been very useful, particularly in regions without more precise data.

DATA SCOPE AND FILE CHARACTERISTICS

The file is blocked and sorted on the UNIVAC 1108 in a compressed file format designed by NAVOCEANO. This format and the geoindex and retrieval system, which are similar to that used for the Ocean Station File, enable easy and rapid access to the desired data, which can then be analyzed or outputted using the 1108 computer.

APPLICATIONS

Temperature profile data are used for thermal structure studies of currents and for acoustic beam propagation. BT data are especially useful for ASW operations in regions with sparse ocean station data.

PLANS FOR THE FUTURE

NODC is not creating any mechanical BT updates at this time; consequently, the annual update has been suspended.

NAVOCEANO
DATA FILE SUMMARY

CODE: 3721

DATE January 1977

TITLE: EXPENDABLE BT

DESCRIPTION OF DATA: Temperature vs depth from expendable bathythermogram data. The majority of observations extend to 456m, a substantial number are to 760m, and a few to 1,800m. Aircraft (AXBT) and submarine-launched (SSXBT) probes are not included because of lesser accuracy.

DATA FORMAT: Digital compressed in Yergen format. File can be queried to retrieve data by geographic area or individual station. Data retrieval subroutines are described in TN 6150-33-75.

UNITS: Degrees Celsius, meters

ACCURACY/PRECISION: Temperature: $\pm 0.2^{\circ}\text{C}$; Depth: greater of $\pm 5\text{m}$ or 2 percent.

SAMPLING INTERVAL: Varies

EXTENT OF COVERAGE: 291,370 stations

PERIOD OF COVERAGE: 1964 to 1976

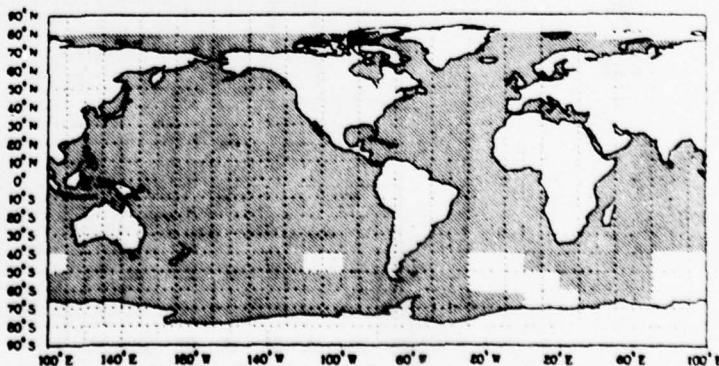
REPOSITORY: Magnetic tape library (Code 5400)

AREA OF COVERAGE: Worldwide

CUSTODIAN: *Richard B. Blumenthal (601) 688-4220*
~~A. Fisher (202) 763-2351~~

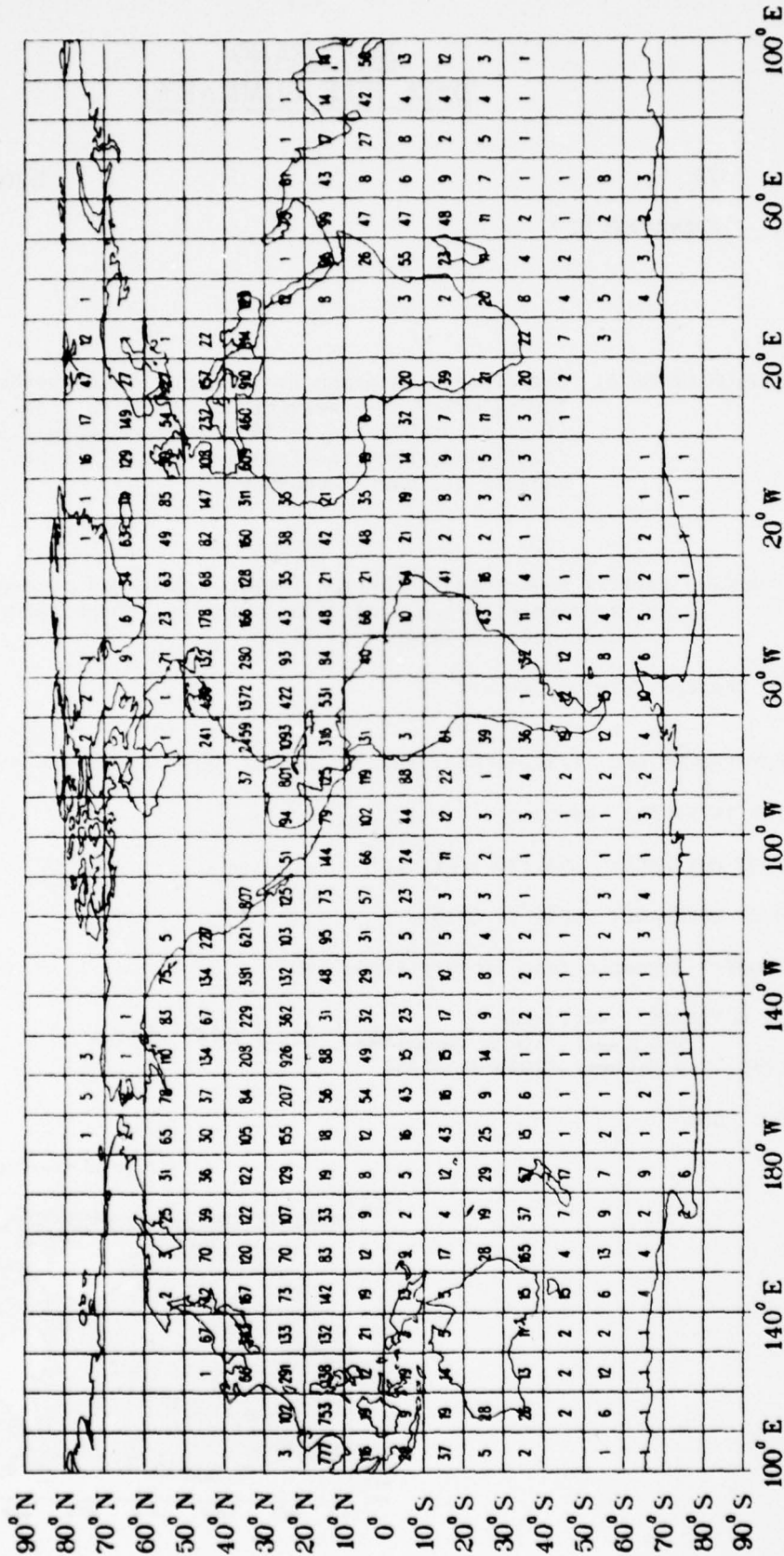
BACKLOG: None

Area of Coverage



DISTRIBUTION OF EXPENDABLE BT DATA

By 10 Degree Squares
(29, 137 Stations x10)



AS OF JANUARY 1977

EXPENDABLE BT

INTRODUCTION

The Expendable Bathythermogram (XBT) File contains digital temperature versus depth readouts from 291,370 observations. The file's program will accept data in three formats: NODC, FNWC, and NAVOCEANO. Whereas the majority of observations extend to 456 m, a substantial number are to 760 m, and a few to 1,800 m.

DATA COLLECTION SYSTEMS

Data in the XBT file were collected with the Sippican shipboard XBT system. Accuracy of the system is ± 5 m or 2 percent of depth. Aircraft (AXBT)- and submarine-launched (SSXBT) probes are not included because of lesser accuracy.

DATA SCOPE AND FILE CHARACTERISTICS

The file is available on magnetic tape compatible with the NAVOCEANO UNIVAC 1108 computer. Data are compressed and station locations cataloged using the GEOINDEX format developed at NAVOCEANO. File construction is essentially the same as the NAVOCEANO ocean station data and mechanical BT files. This format provides a significant savings in space and permits rapid access to desired data. The file is updated whenever NODC, NAVOCEANO, and FNWC updates are available. An increase of about 10 percent occurs with each update.

UTILITY PROGRAMS

A series of data handling programs is available. Individual stations, smoothed or unsmoothed; statistical processing of data sets for given areas and temperature regimes; and histograms of temperature at various levels and some layer depth are available. These utility programs are described in NAVOCEANO technical note/TN6150-39-75.

APPLICATIONS

The XBT file frequently is used to provide typical temperature profiles as input to acoustical predictions for Fleet ASW operations. The ocean station file is also used for historical approximation of the near-surface temperature structure (sonic layer depth, inversions, and gradients). The file is presently being used to prepare monthly temperature profiles for each watermass included in the ICAPS file.

FUTURE PLANS

Future plans included additional watermass and thermal structure studies based on the data in this file.

NAVOCEANO
DATA FILE SUMMARY

CODE: 34312

DATE January 1977

TITLE: CLIMATOLOGY

DESCRIPTION OF DATA: Air temperature, injection sea surface temperature, sea, swell, waves, winds, and weather summarized by 1-degree square and month.

DATA FORMAT: Compressed binary format sorted by Marsden Square

UNITS: Temperatures in degrees Celsius, sea and swell in Douglas code, waves in WMO code, winds in Beaufort force, and weather in WMO code.

ACCURACY/PRECISION: Accuracy unknown, precision in units specified.

SAMPLING INTERVAL: 6-hrs.

EXTENT OF COVERAGE: 17,795,300 Observations

PERIOD OF COVERAGE: 1850 - 1969

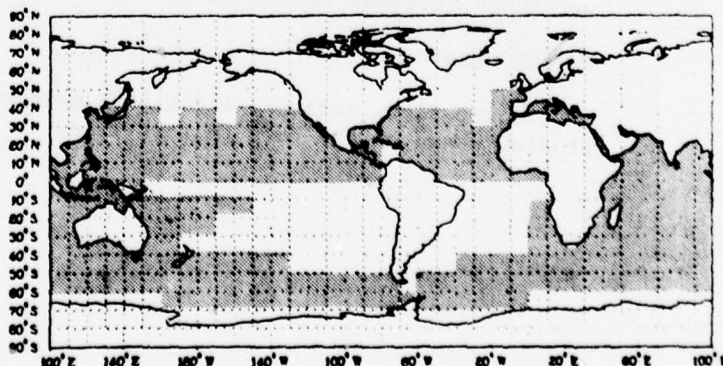
REPOSITORY: Magnetic tape library (Code 5400)

AREA OF COVERAGE: 40°N - 70°S, with large gaps in South Atlantic and South Pacific

CUSTODIAN: R. Blumenthal ~~(202) 433-3257~~
~~████~~ (601) 688-4220

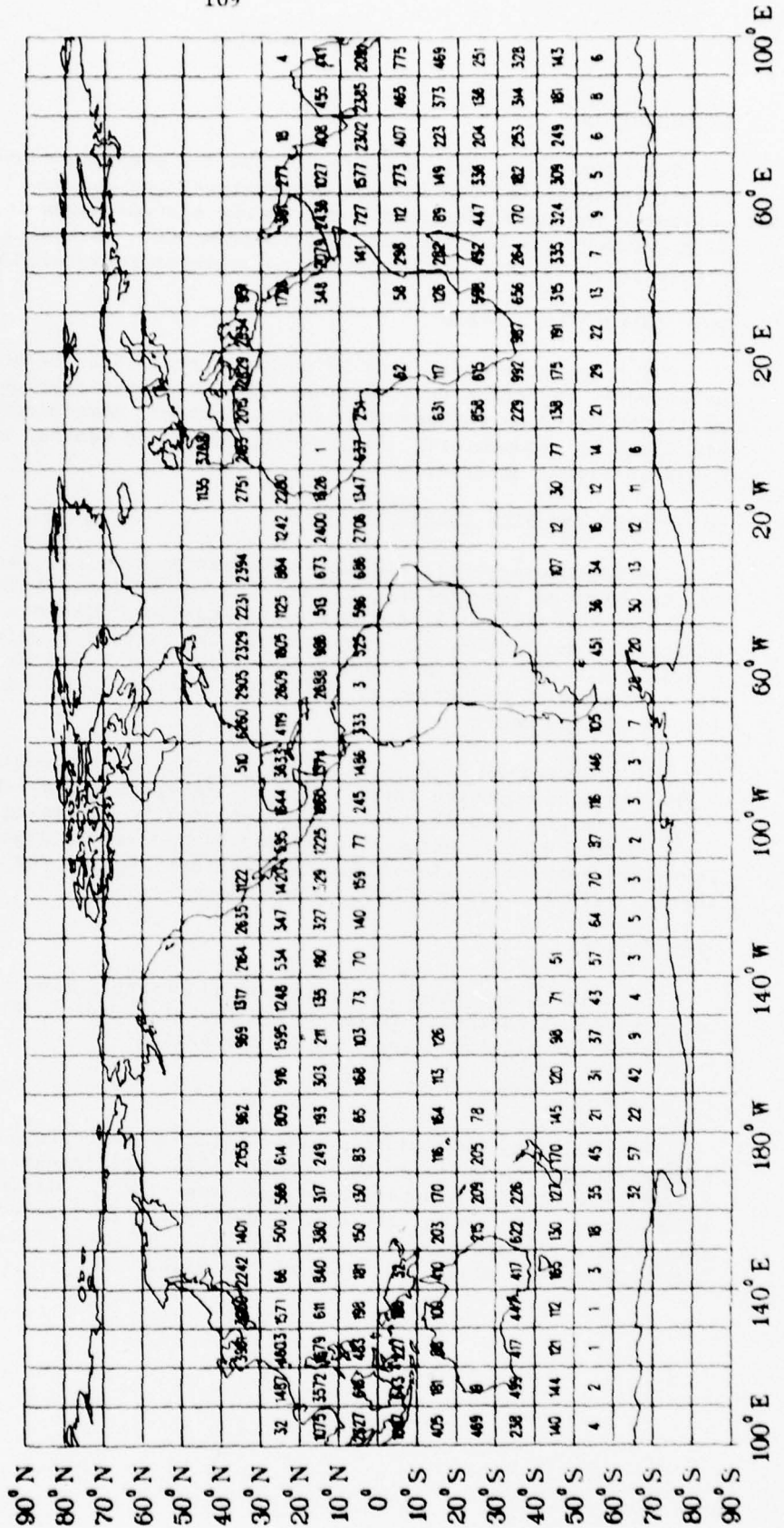
BACKLOG: None

Area of Coverage



DISTRIBUTION OF CLIMATOLOGY DATA

By 10 Degree Squares
(177, 953 Observations x100)



CLIMATOLOGY

INTRODUCTION

The Climatology File contains 17,795,300 summarized observations of air temperature, sea surface temperature, sea and swell, winds, and weather. The data were obtained from the sorted-common-format FNWC file derived from multiformatted data from NCC. Much of the data has errors in sea states and winds due to improper conversion of certain decks.

DATA COLLECTION SYSTEMS

Air temperatures are read by thermometers. Sea surface temperatures are usually injection temperatures. Most wind observations are visual estimates based on the Beaufort scale; however, most recent wind observations are taken by anemometers. Sea, swell, wave, and weather conditions are based on visual observations.

DATA SCOPE AND FILE CHARACTERISTICS

The Climatology File contains observations of: (1) air temperature, (2) sea surface temperature, (3) air-sea temperature difference, (4) wind direction and force, (5) sea and swell state and direction or wave height, direction, and period, (6) cloud cover, (7) visibility, (8) weather conditions. The file is a summarized file; i.e., logical records contain the frequency distribution of the values of a given parameter in a 1-degree square for one month.

The Climatology File is structured in the Yergen compressed binary format on nine magnetic tapes. Blocks are 4,300 bytes long and contain variable length records. Records are sorted in ascending order according to a sorting number system that increases by Marsden Square. A block inventory enables bypassing data blocks that precede the specified block, thereby saving considerable computer time.

APPLICATIONS

The Climatology File is sometimes used to fill wind, sea, swell, and meteorological parameter requirements for Mine Warfare Pilots. It also is available for filling internal data requests.

PLANS FOR THE FUTURE

This file was created to satisfy internal requests for data when NAVOCEANO was responsible for preparing National Intelligence Studies (NIS). Since these studies are no longer prepared by this office, this file is seldom used. In view of the delays during the last several years in receiving a climatology file from FNWC that is free of errors, there are no immediate plans for updating the file.

NAVOCEANO
DATA FILE SUMMARY

CODE: 34312

DATE January 1977

TITLE: SURFACE CURRENTS

DESCRIPTION OF DATA: Comprised principally of multinational ship-drift observations of surface current, speed, and direction. Some surface current meter data and Japanese GEK data are included and assigned identifier numbers.

DATA FORMAT: Compressed binary format sorted by Marsden Square.

UNITS: Direction by 36 points of compass, speed in knots (and tenths).

ACCURACY/PRECISION: $\pm 10^\circ/\pm 0.1$ Knot

SAMPLING INTERVAL: 6 - 12 hours

EXTENT OF COVERAGE: 4,190,800 Observations

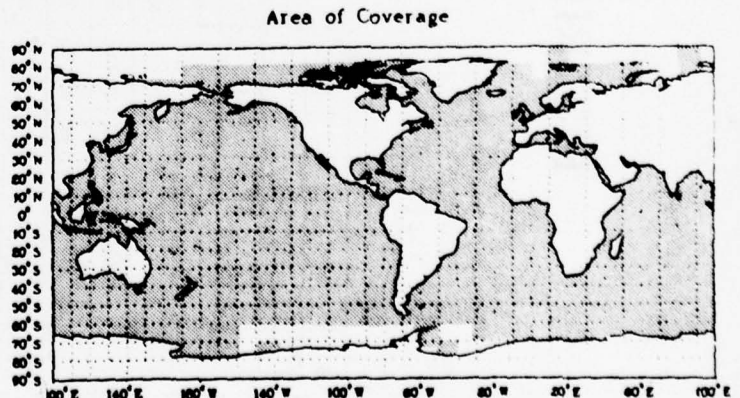
PERIOD OF COVERAGE: 1870 - 1976

REPOSITORY: Magnetic tape library (Code 5400)

AREA OF COVERAGE: Worldwide

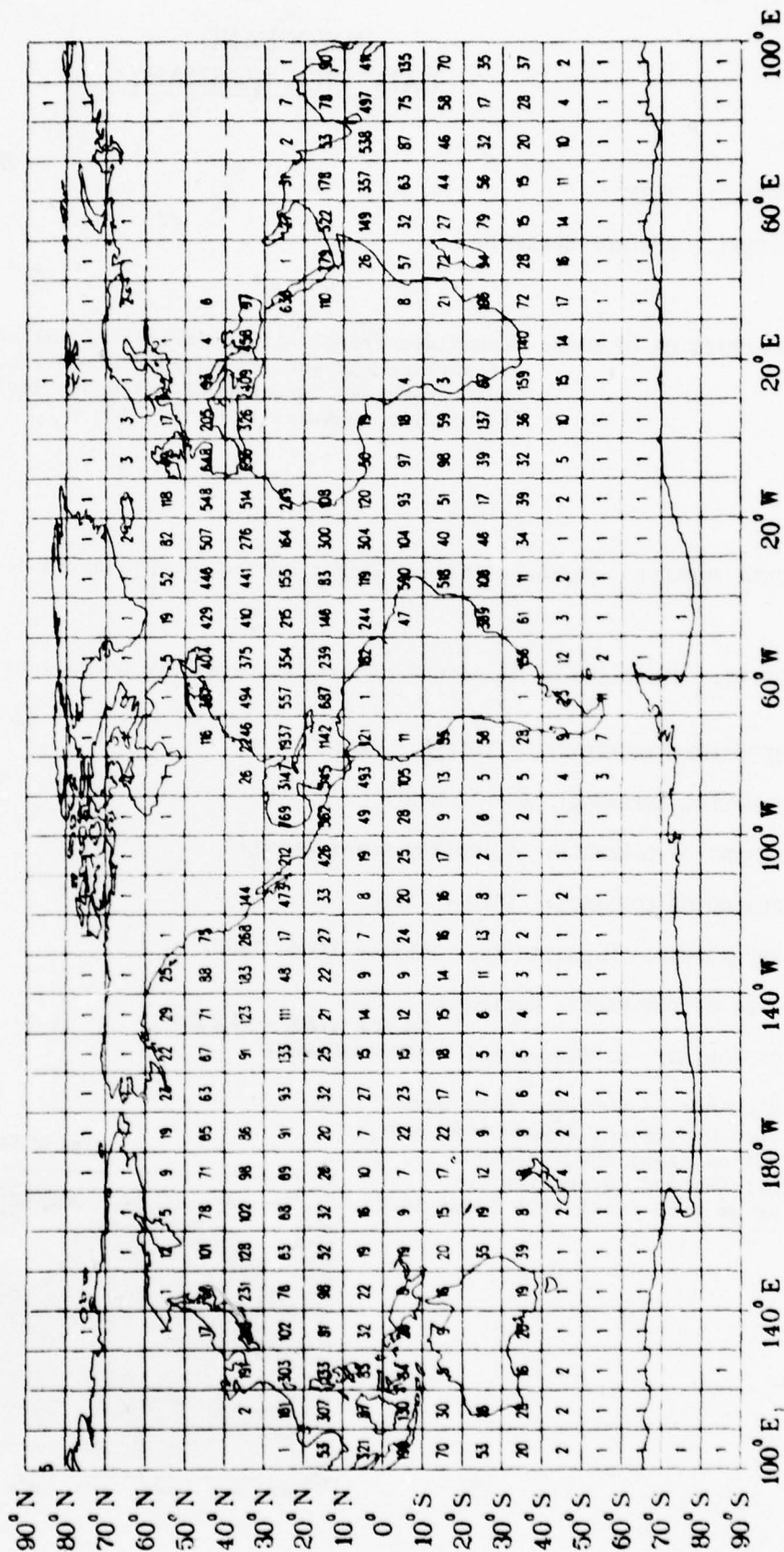
CUSTODIAN: R. Blumenthal (601) 688-4220
(202) 433-3257

BACKLOG: 7,000 obs; data have been processed, keypunched, and put on tape; now awaiting editing and correcting for merge into final file (June 1977).



DISTRIBUTION OF SURFACE CURRENT DATA

By 10 Degree Squares
(41,908 Observations x100)



AS OF JANUARY 1977

SURFACE CURRENTS

INTRODUCTION

The Surface Current File consists of approximately 4,200,000 multinational observations of surface current derived from ship drift.

DATA COLLECTION SYSTEMS

Data are essentially vector differences between direction-speed projections of ship position (assuming no drift) at a given time and the actual position at that time. Accuracy of the current determination depends on accurate fixes especially at low current speeds. A few thousand newer observations in the file are based on data tapes extracted from the Scripps shipboard navigation system. Some surface current meter data and some Japanese GEK data also are included.

DATA SCOPE AND FILE CHARACTERISTICS

The surface current file contains detailed information as to date, origin, and location within 6 minutes of latitude and longitude, as well as the speed in tenths of a knot and direction by the 36-point compass (10 degrees). A shorter production file containing only speed, direction, and location to within 1 degree of latitude and longitude is used whenever the more detailed information isn't needed. The surface current file is structured in the Yergen compressed binary format on two magnetic tapes. The shorter production file requires only one tape. Blocks are 4,800 bytes long and contain variable length records. Records are sorted in ascending order by 10° and 1° Marsden Squares and month according to a sorting number system that increases by Marsden Square through the Northern Hemisphere and then through the Southern Hemisphere. A block inventory enables bypassing data blocks that precede the specified block, thereby saving considerable computer time.

APPLICATIONS

The primary user application is a surface current atlas consisting of plots of prevailing direction-arrow, number of observations, mean speed, resultant direction, and percent frequency per 1° square monthly or seasonally for areas of several 10° Marsden Squares. Also available are CRT microfilm graphic plots of current roses and ellipses for specified regions of 6-minute or 1° squares. There are printer listings of individual observations and monthly frequency distributions by 1° square, 6-minute squares, or combinations thereof.

PLANS FOR FUTURE

Arrangements have been made to obtain, on a continuing basis, data tapes extracted from the Scripps shipboard navigation. It is hoped to eventually obtain and merge data from other shipboard navigation systems, including NAVOCEANO's.

NAVOCEANO
DATA FILE SUMMARY

CODE: 3431

DATE January 1977

TITLE: SUBSURFACE CURRENTS

DESCRIPTION OF DATA: Subsurface current speed and direction. Data collected with Richardson Geodyne-type current meters implanted in a taut-lined, bottom-anchored array.

DATA FORMAT: Digital, even parity, BCD code, stored on magnetic tape.

UNITS: cm/sec

ACCURACY/PRECISION: ± 2 cm/sec

SAMPLING INTERVAL: Variable (1-60 minutes)

EXTENT OF COVERAGE: 806 Records

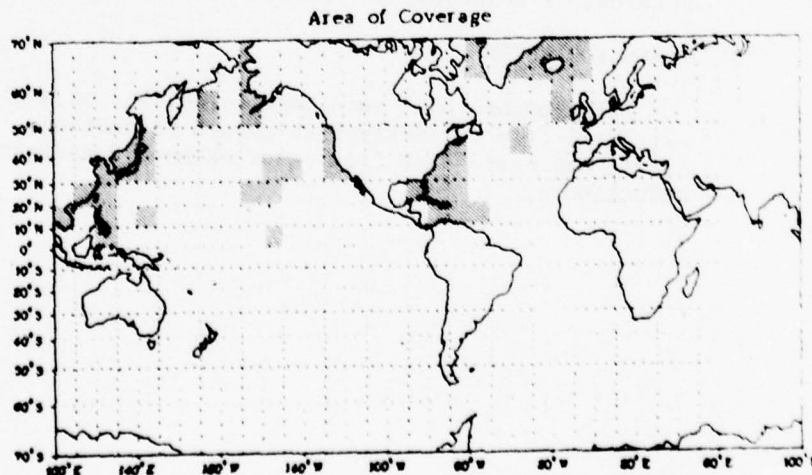
PERIOD OF COVERAGE: 1964-1977

REPOSITORY: Magnetic tape library (Code 5400)

AREA OF COVERAGE: Worldwide

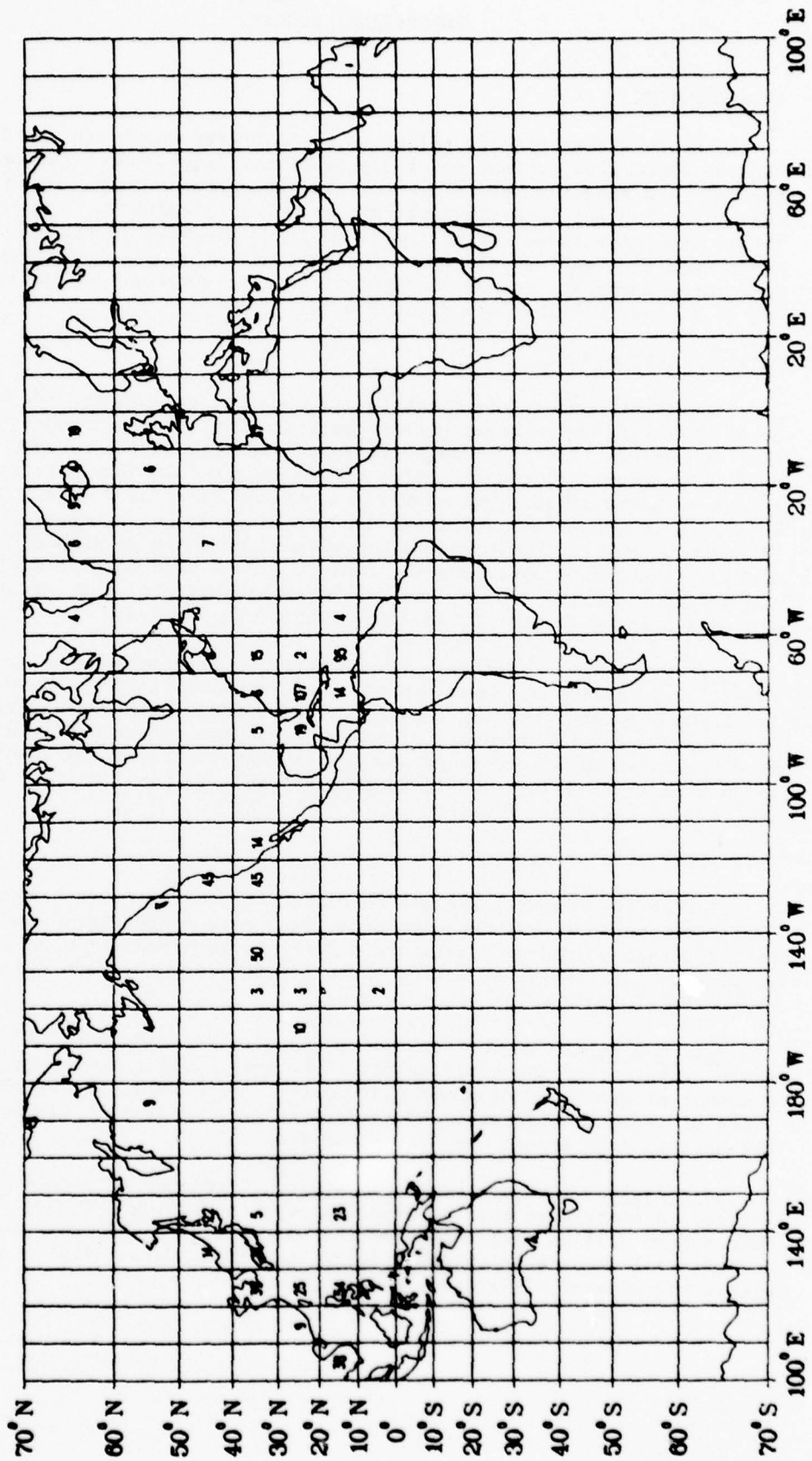
CUSTODIAN: *Richard B. Blumenthal (601) 688-4220*
~~O. Smith (202) 433-3257~~

BACKLOG: 20 Records



DISTRIBUTION OF SUBSURFACE CURRENT DATA

By 10 Degree Squares
(806 Records)



AS OF JANUARY 1977

SUBSURFACE CURRENTS

INTRODUCTION

Subsurface current data collected by NAVOCEANO only with the Richardson, Geodyne A-101-type current meter are described below. Data gathered with the VACM and Aanderaa meters are not reported because they are not being serialized and put into the supermaster format. Beginning in the early 1960's, the Richardson current meter replaced previous instruments and has since been used exclusively in all operations. The measurements are being made for weapons systems development, to define currents in test ranges, and in support of fleet operational needs.

DATA COLLECTION SYSTEMS

Subsurface current measurements are obtained through the use of moored arrays carrying up to seven current meters. Data are recorded in digital form on optical film or on magnetic tape depending on the current meter used. The meters provide a choice of sampling rate. They use Savonius-type rotors as speed sensors and have a measurement range of 2 cm/s to 250 cm/s. When used in subsurface moorings, good results can be expected. Comparisons of Savonius current speed recordings with current speeds obtained using Swallow floats show agreement to within 0.3 cm/s when both sets of data are averaged over periods of one day. The approximately 806 records on hand are being added to at the rate of about 80 per year.

Current Surveys. Surveys are conducted by Navy oceanographic ships, Fleet tugs, Coast Guard buoy tenders, and some foreign navy ships. Array locations are determined at the time of deployment using SATNAV and/or Loran-C. During the recovery process the precise location of the array is established using the range and bearing components of the acoustic release and command units. It is thus possible to position the ship within 100 feet of the array location.

DATA REDUCTION AND FILES

The Geodyne film records are developed and converted to a computer-compatible magnetic tape through an optical data converter (OPDAC). The data are then edited and processed further as required for each particular application and stored on master tapes (in BCD format), each containing approximately 20 current meter records.

Data Analysis. The UNIVAC 1108 is used to edit the data and perform basic graphics and spectral analysis. Computer routines are available for a number of graphical displays that include histograms, vector plots, analog plots of vector components, and spectral plots. A statistical summary of the data in each record can also be produced.

Data Banks. Data are presently stored 20 records to a tape in BCD format. A compressed current data file with accessing software is underway. This system will be operational on the UNIVAC 1108. The basic surface current file contains detailed information giving data, origin, and location within six minutes of latitude and longitude.

APPLICATIONS

Weapons Systems Development. The current data provide design engineers and program managers with information needed for the design of Navy weapons systems. Emphasis on the extension current measurement periods of six months to one year is being stressed. The data are used to compute dip and drag forces on moored mine systems and to predict motions of free-drifting surveillance systems.

Fleet Operational Support. Current measurements are being obtained on a regular and continuing basis in support of operational requirements. Examples include surveys of specific areas for mine warfare and in Navy test sites. Measurement programs have been established in the past in support of search operations.

FUTURE PLANS

NAVOCEANO now has several over-the-side current profilers that will be used extensively in the future. Developments of unattended and free-fall profilers will be carefully followed. A major procurement of current meters is underway for an expanded program.

NAVOCEANO
DATA FILE SUMMARY

CODE: 34312

DATE January 1977

TITLE: SUBSURFACE CURRENT (Reference/Data)

DESCRIPTION OF DATA: This reference file is a collection of subsurface current information composed largely of references to reports and publications in the open literature. A small portion of the file, however, contains copies of actual data from published and unpublished material.

DATA FORMAT: Reference folders filed by 1° Marsden Squares.

UNITS: cm/sec, knots, miles/day.

ACCURACY/PRECISION:: Varies depending upon the source.

SAMPLING INTERVAL: Both instantaneous and continuous.

EXTENT OF COVERAGE: 4,020 References

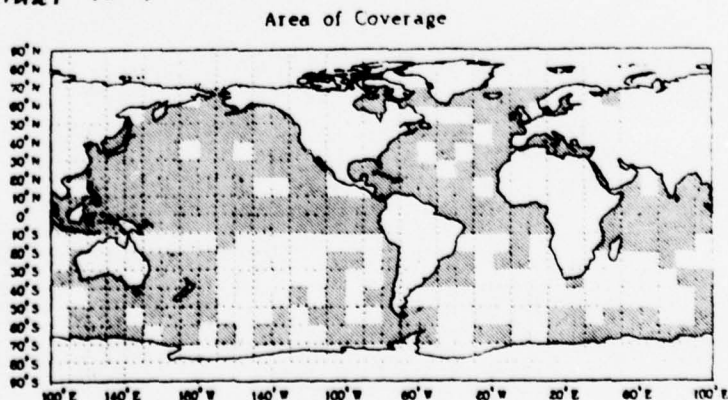
PERIOD OF COVERAGE: 1850-1977

REPOSITORY: Code 34312

AREA OF COVERAGE: Worldwide

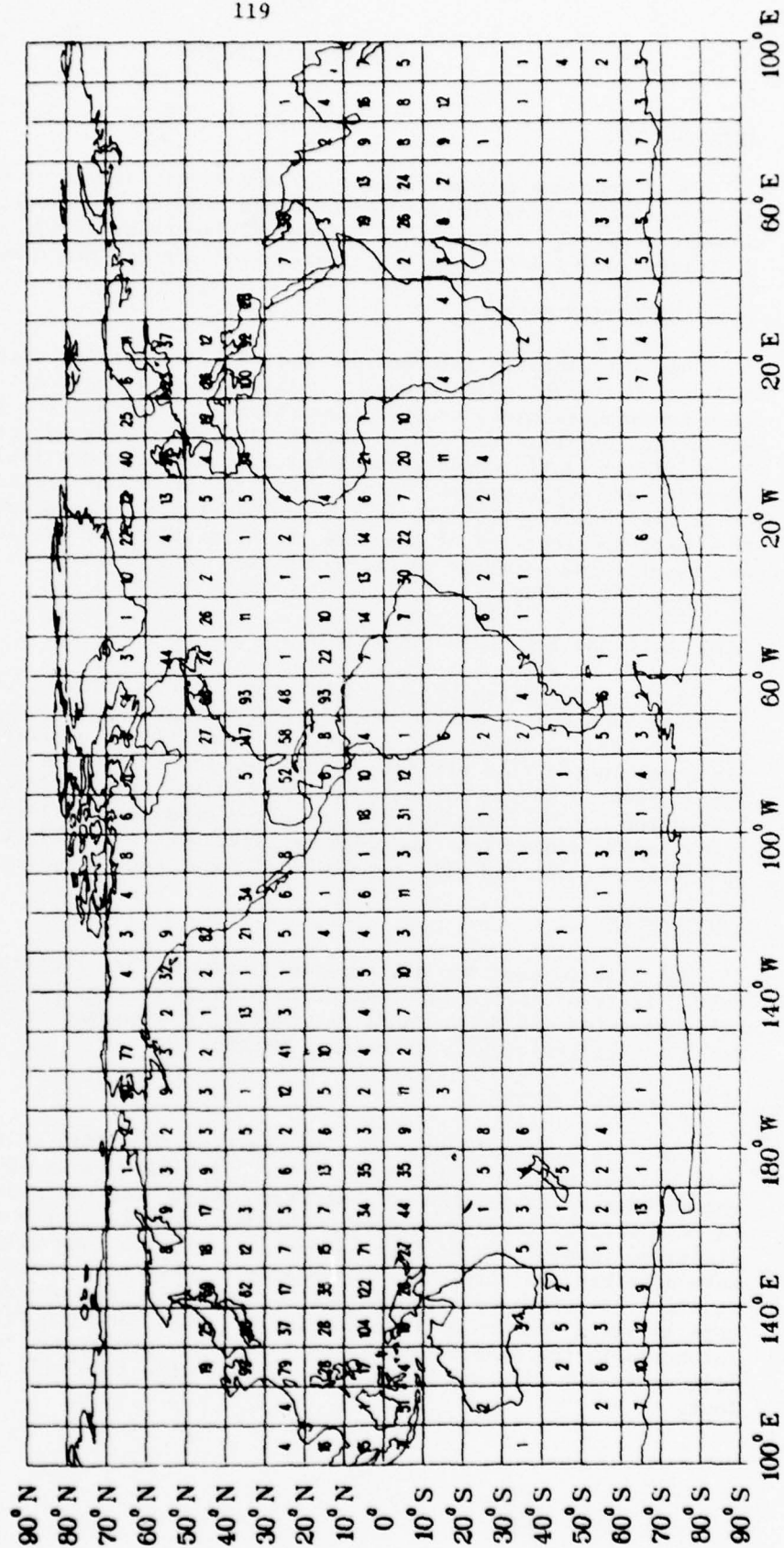
CUSTODIAN: *Richard B. Blumenthal (601) 688-4220*
~~H. F. Bollevort~~
~~(202) 433-2100~~

BACKLOG: None



DISTRIBUTION OF SUBSURFACE CURRENT REFERENCES

By 10 Degree Squares
(4,020 References)



AS OF JANUARY 1977

SUBSURFACE CURRENT

INTRODUCTION

The Subsurface Current Reference/Data File consists of 4,020 citations of direct subsurface current measurements made in nearshore, coastal, and oceanic regions. A Subsurface Current Bibliography of 406 sources is being digitized and will include all citations of current measurements.

DATA COLLECTION SYSTEMS

The file contains information on subsurface current measurements obtained by over 50 recognized methods. The file material was compiled since 1962 mainly from reports, studies, and publications to help reduce the general void of subsurface current data and to satisfy increasing demands for this type of data. Processed and analyzed data are included if readily available. Most of the data, however, are not digitized into a standard format and are manually filed and cross-referenced by 10° and 1° Marsden Squares. Intended mainly for use in-house, the contents of the file are presently made available "as is," and usually the material requires analysis or special handling by the user to meet specific needs.

DATA SCOPE AND FILE CHARACTERISTICS

Before it is filed by geographic region, the material containing data is examined to assure that the minimum information required is given: i.e., date, position, depth, speed, and direction. The file is utilized manually. The 4,020 citations in the file are data references for 1° squares and are derived from 406 sources; a source may have one, or several cross-referenced citations. A citation may be comprised of a detailed computer listing of time-series data, or be simply a notation that data may have been (or will be) obtained by a particular source and will require additional search by the requester.

APPLICATIONS

The file is used for all types of products that require subsurface current data. It is of particular importance because it supplements the sophisticated Subsurface Current Meter (ADP) file which is comprised of relatively few current meter arrays principally in coastal waters.

PLANS FOR THE FUTURE

There is presently an effort to digitize this file so that its contents will be available in a standard format. A bibliography of 406 sources has been established and a portion has been keypunched (see enclosure); these sources will be retrieved by Marsden Squares. The data from 21 of the sources have been digitized (coded) and will be keypunched. Subroutines will be written that will make possible the retrieval of summarized subsurface current data by 1° square. Positions of the data will be given by latitude and longitude. This work is being done on a "time-available" basis, and the file will not be fully automated in the near future. The format and procedures for maintaining this file as an ADP file are being documented so the file will not be irretrievably lost.

NAVOCEANO DATA FILE SUMMARY

CODE: 3422

DATE January 1977

TITLE: UNDERWATER LIGHT TRANSMISSION DATA

DESCRIPTION OF DATA: Volume Attenuation Coefficient (α) - Data recorded on X-Y recorder, using standard 8 1/2" X 11" graph paper, as continuous trace of percent light transmittance over 1 meter path from surface to instrument depth.

Diffuse Attenuation Coefficient (k) - Raw data recorded manually: Depth, E_0 (surface illuminance in ft. candles), R (reflectance), and E_D/E_0 (illuminance ratio downwelling/surface)

DATA FORMAT: Volume Attenuation - Raw data: analog trace of % transmission with depth; Finished data: computer printout of % transmission and α .

Diffuse Attenuation - Raw data: manual log of Depth, E_0 , R , E_D/E_0 ; Finished data: Graphic determination of " k " by logarithm plot of E_D/E_0 vs depth.

UNITS: Volume attenuation coefficient (α)
Diffuse attenuation coefficient (k)

ACCURACY/PRECISION: Volume Attenuation - Recorder range 0 - 100% transmission 0 - 100 m depth. Transmissometer receptor sensitive from 350 nm - 1100 nm wave lengths. Error in α is 1%. System accuracy $\pm 1\%$.

Diffuse Attenuation - E_0 from 0-9,999 ft. candles; k from .01-5.0 m^{-1} ; R from 0-9.999%; E_D/E_0 from 99.99% - .009999%.

SAMPLING INTERVAL: Volume Attenuation - Continuous trace
Diffuse Attenuation - Discrete readings at approximately 5 meter intervals with depth.

EXTENT OF COVERAGE: 1,090 Stations (813 Stations- α , 277 Stations- k)

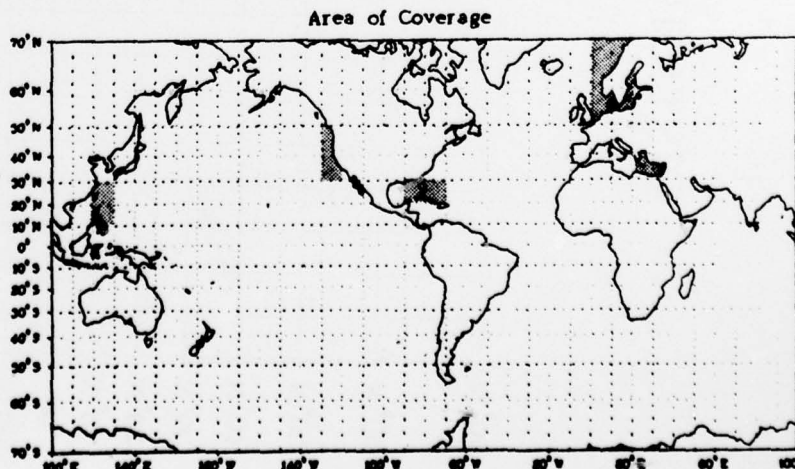
PERIOD OF COVERAGE: 1970-1976

REPOSITORY: Code 3422

AREA OF COVERAGE: U.S. and
Foreign Coastal
areas.

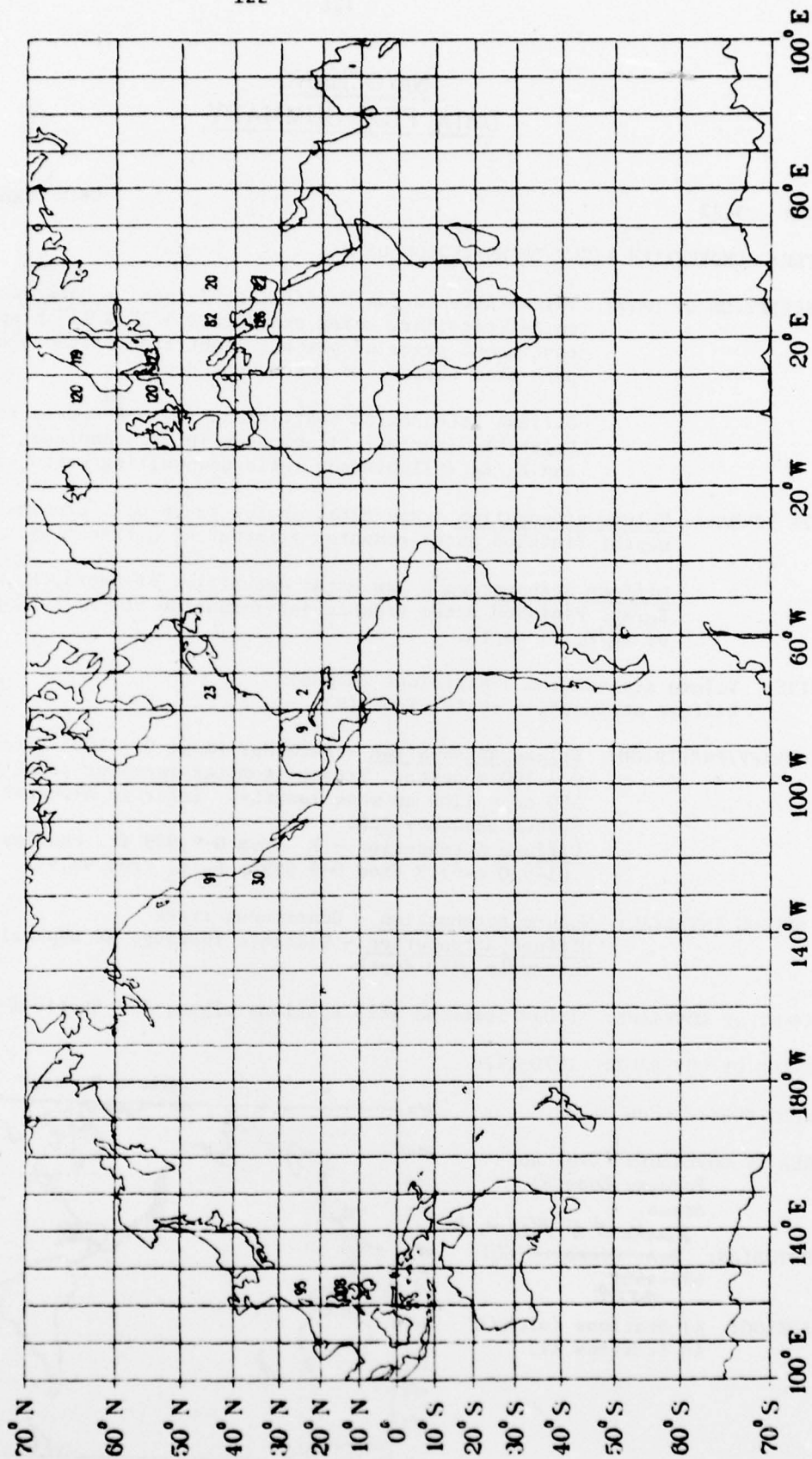
CUSTODIAN: *Renkert G. Meyer, Jr.*
~~R.A. Stewart~~ (601)
688-4481
4524

BACKLOG: 83 Stations (α);
40 Stations (k)



By 10 Degree Squares

(1,090 Stations)



AS OF JANUARY 1977

UNDERWATER LIGHT TRANSMISSION

INTRODUCTION

The volume attenuation coefficient (α) was determined at 813 stations in the Formosa Strait, Nansei Shoto straits, Mindoro, San Bernardino, and Surigao Straits, coastal areas of Norway, Denmark, Germany, Greece, and Turkey; and in the Pacific and Atlantic coastal regions off the contiguous United States. The data are derived from percent transmittance in the form of analog graphics. The graphics show percent transmittance vs depth.

The diffuse attenuation coefficient (k) was determined at 277 stations along coastal Norway, Denmark, Germany, Greece, Turkey; and Formosa Strait and the straits of Mindoro, San Bernardino, Surigao, and Nansei Shoto. The data are derived from plots of the ratio of downwelling and surface illuminance at successive depths.

INSTRUMENTATION

Volume Attenuation

The measurements were made with an underwater transmissometer developed at Scripps Institution of Oceanography and now manufactured by MARTEK Instruments, Incorporated. The instrument measures the transmission loss of a narrow beam (20-mm diameter) over a folded one-meter path with no correction for the collection of incidental forward scattering. The beam size is small enough, however, to limit the forward scattering effect on accuracy to less than 1.0 percent. System performance as given by the manufacturer is as follows:

Useful Range of Alpha measurements	0.1 to 4.6 meters - for 1-meter path length
Display Range	0-10, 0-25, and 0-100% transmittance
Ambient Light Interference	Negligible
Operating Depth	0-1000 ft.
Operating Temperature	-2° to 40°C
Overall System Accuracy	$\pm 1.0\%$

As the bulk of data attained is in coastal areas, no one standard filter is used. Wratten filters varying in wavelength from 473 to 534 nm (peak) are substituted as required to achieve maximum transmission. The total time for a lowering--including setup and calibration--was about 30 minutes. Lowerings were made both day and night, since the instrument is not affected by ambient light.

Diffuse Attenuation

Measurements were made with an oceanographic illuminometer developed and built by Scripps Institution of Oceanography. The instrument is employed to determine the rate at which the diffuse or natural light field diminishes with depth. The determination is derived from comparisons of incident light at

the air/sea interface with light available at various depths. Incident surface illumination is measured via an upward-facing surface-mounted photocell, and compared to the voltaic readings received from an upward-facing underwater cell of similar sensitivity. Depth is acquired from a 100-psi transducer, and a downward-facing photo cell measures illuminance coming from below the submerged instrument. Incident surface illuminance is measured in induced microvolts and displayed on a console as foot-candles. The underwater illuminance readings are again measured in induced microvolts, but are displayed as ratios--ratios of downwelling illuminance at depth vs downwelling illuminance at the surface (E_D/E_0), and upwelling illuminance at depth vs downwelling illuminance at depth (E_U/E_D).

Diffuse attenuation coefficient measurements were made generally by single lowerings at each station. The total time of a lowering was approximately 30 minutes. Data were taken only between the hours of 0900 and 1500, preferably 1000 and 1400, and when there was no precipitation. The deck cell is very susceptible to moisture.

DATA SCOPE

The data record for volume attenuation is an analog graph of percent transmission vs depth. Percent transmission is converted to alpha (volume attenuation coefficient), and tabulated via computer at discrete depths; normally one-meter intervals.

The data record for diffuse attenuation is a semilog plot of E_D/E_0 vs depth. The resulting slopes of the line segments are the values of "k". The "k" values, depth segments pertinent, and the "Reflectance ratios:-- E_U/E_D " are tabulated by computer. If volume attenuation coefficient (alpha) data are available and applicable, then further computer manipulation is warranted, producing a C_w or contrast in the water. A cumulative contrast or C_w sum is the incremental C_w for each one-meter depth totaled at each discrete depth. The data are published in survey data reports, and disseminated to interested parties only. The data are stored on punch cards by Code 3422.

FUTURE PLANS

Data gathered with present systems are adequate for our data requirements, however, data handling will be made easier by purchasing future systems which allow magnetic tape data acquisition and processing.

A program has been written in FORTRAN that employs these variables, along with system and target variables, to analyze the limitation of underwater optical viewing systems. The primary program output is the visibility (total illumination and scene modulation received by a sensor) of a target of interest.

NAVOCEANO
DATA FILE SUMMARY

CODE: 34312

DATE January 1977

TITLE: OCEAN STATION

DESCRIPTION OF DATA: Temperature vs depth from reversing thermometers; salinity, oxygen, and other chemical properties from Nansen bottle water samples; water transparency from Secchi disk. Sigma-t and sound velocity are computed from temperature, depth, and salinity.

DATA FORMAT: Digital, compressed file format in geosort order.

UNITS: Standard oceanographic units: degrees Celsius, meters, parts per thousand, meters per second.

ACCURACY/PRECISION: Temperature $\pm 0.02/\pm 0.01$ degrees C; Salinity $\pm 0.01/0.01$ parts per thousand; Sound Velocity $\pm 0.4/\pm 0.1$ meters/second.

SAMPLING INTERVAL: In most cases standard depths are used.

EXTENT OF COVERAGE: 507,130 Stations

PERIOD OF COVERAGE: 1920 - 1975

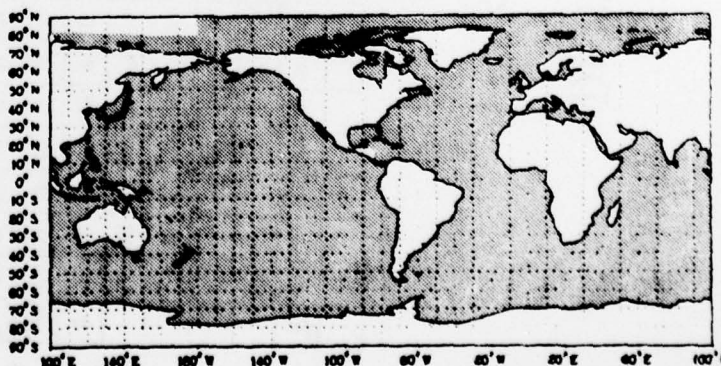
REPOSITORY: Magnetic tape library (Code 5400)

AREA OF COVERAGE: Worldwide

CUSTODIAN: R. Blumenthal (601) 688-4220
(202) 433-3257

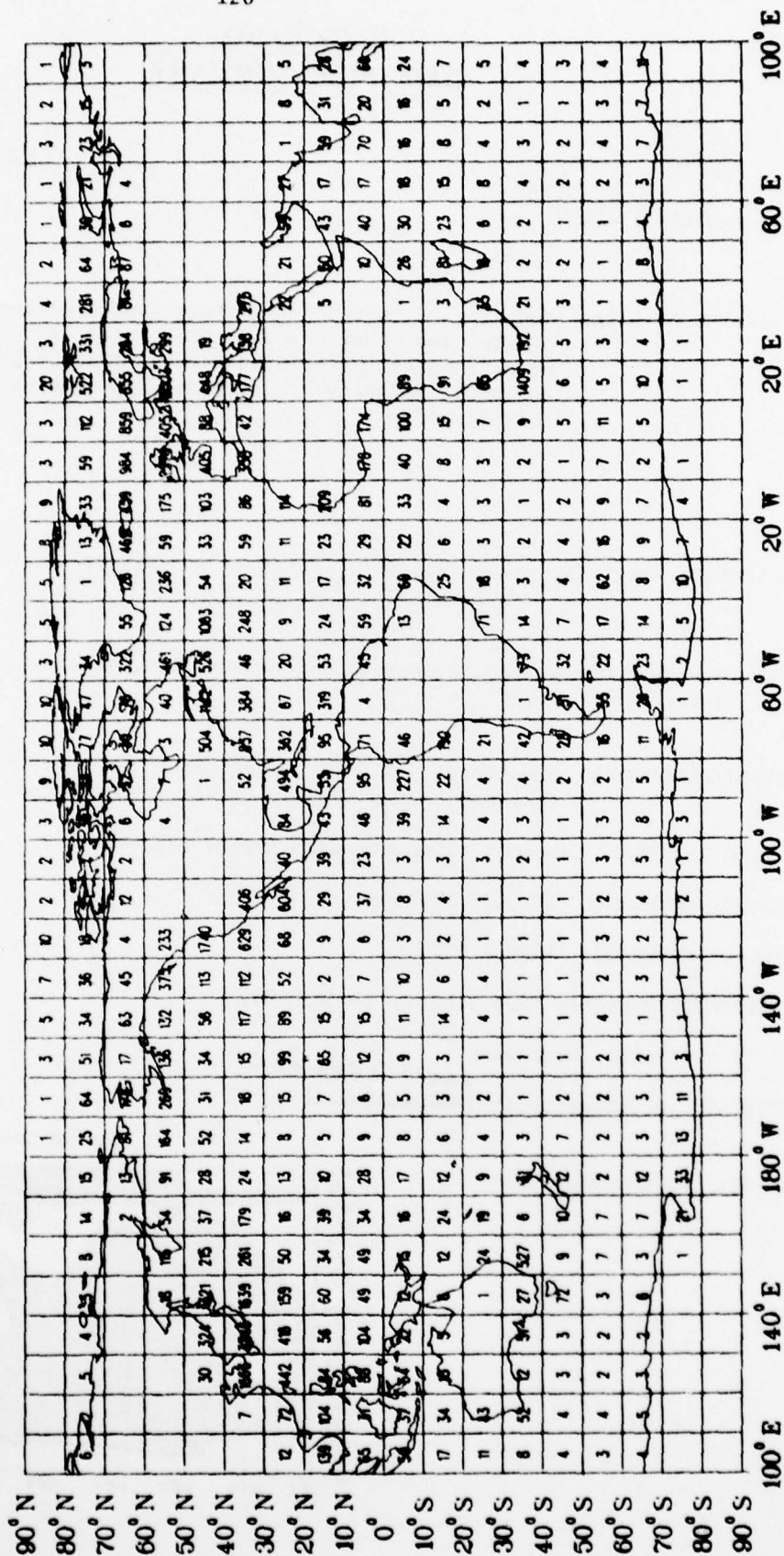
BACKLOG: 40,000 Stations

Area of Coverage



DISTRIBUTION OF OCEAN STATION DATA

By 10 Degree Squares
(50, 713 Stations x10)



AS OF JANUARY 1977

OCEAN STATION

INTRODUCTION

The Ocean Station File is comprised of Nansen cast data obtained worldwide since the early 20th century by many agencies and nations. The file includes data from 507,130 casts through 30 June 1975. Approximately one-third of these casts are from the North Atlantic; one-third from the North Pacific; and one-third scattered throughout the remainder of the world's oceans. A separate, classified, limited-access file of data from 3,100 casts is also maintained. Products originating from the Ocean Station File are used as planning aids for naval operations such as antisubmarine warfare.

DATA COLLECTION SYSTEMS

Temperature data are read from reversing thermometers and salinity data are obtained by electrical or chemical analysis of water samples from Nansen bottles. Water transparency is taken from Secchi disc readings. Sound velocity is computed from the temperature, salinity, and depth determinations.

DATA SCOPE AND FILE CHARACTERISTICS

The Ocean Station File contains temperature, density ($\sigma - t$), salinity, sound velocity, alkalinity, oxygen, silicate, nitrate, and phosphate profiles. Also included are observations of weather, water color, water transparency, and bottom depth. The density ($\sigma - t$) and sound velocity data are derived from measurements of temperature, salinity, and pressure.

The Ocean Station File is structured according to the "NAVOCEANO Compressed File Format." Data, originally archived digitally by NODC, have been compressed into variable-length records on fixed-length blocks of 896 6-byte words. The records are sorted in ascending order by 10° and 1° squares and month according to the NAVOCEANO "Geosort System". The entire file is contained on six tapes, and processing is currently being done on the UNIVAC 1108.

A geoindex and compressed file retrieval system greatly facilitates rapid accessing of data in the desired area and provides for a preliminary population count. The data are returned in a common block to the user program. There is a FASTRAND file on the 1108 that contains many user analysis and output programs.

APPLICATIONS

The prime use of the Ocean Station File is to generate a sound velocity model from 200 m to the bottom. This model is available on a 30-minute grid and is recoverable at any latitude and longitude with an RMS error of 1 m/s. The data are also used for nonacoustical applications of temperature, salinity, and density as profiles or surface distributions. Also of interest are geographical distributions of chemical properties of

seawater such as oxygen and phosphates, and physical properties such as transparency and color. Many items are amenable to graphic display such as CRT microfilm plots of temperature, salinity, sigma - t, sound velocity profiles, or plots of acoustical ray paths.

PLANS FOR FUTURE

The Ocean Station File will be updated annually using tapes acquired from NODC. Each annual update should add about 30,000 to 40,000 observations to the file. Some Salinity-Temperature-Depth recorder data will be included in future updates. A model of salinity from the surface to 780 m is being developed. This model will have an RMS accuracy of ± 0.05 parts per thousand and will be used in conjunction with an expendable BT for sound velocity computations.

NAVOCEANO
DATA FILE SUMMARY

CODE: 34312

DATE January 1977

TITLE: SVSTD STATION DATA

DESCRIPTION OF DATA: Sound Velocity, Salinity, Temperature, vs Depth (SVSTD) data collected with electronic sensors at a 0.5-second sampling rate and reported as one meter averages. Simultaneously collected Niskin sampler data were used to validate/correct observed data. Depths were corrected for in-situ density. File also includes computed values of sound velocity, sigma-t, and specific volume anomaly.

DATA FORMAT: Digital, magnetic tape (800BPI; even parity;BCD;blocking factor X10). File can be queried to indicate available stations by location, date, platform, cruise, and/or station number. Stations retrievable individually.

UNITS: Standard oceanographic units. Temperature-degrees Celsius; Salinity - parts per thousand; Sound Velocity-meters per second; depth-meters.

ACCURACY/PRECISION: Temperature- $\pm 0.02/0.01$ °C; Salinity- $\pm 0.02/0.01$ ‰, Sound Velocity- ± 0.3 m/sec (computed)/0.1 m/sec (observed); Depth- $\pm 0.25/0.1$ ‰ full scale.

SAMPLING INTERVAL: 0.5 second at lowering rates of 20-60 meters per minute.

EXTENT OF COVERAGE: 1,908 Stations

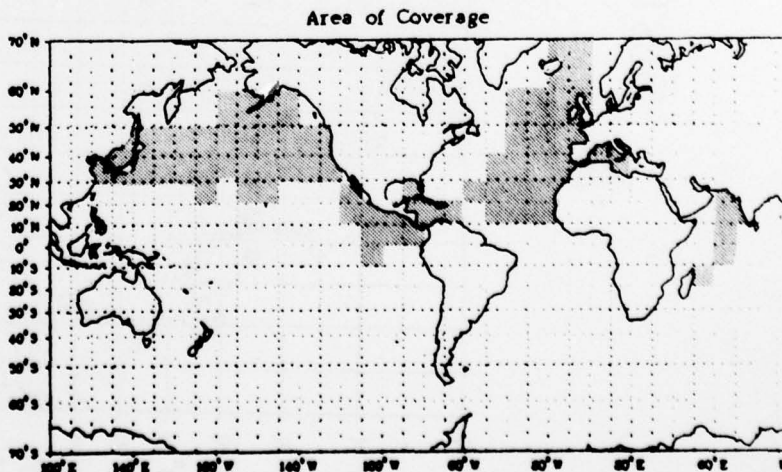
PERIOD OF COVERAGE: 1970 - 1977

REPOSITORY: Magnetic tape library (Code 5400)

AREA OF COVERAGE: Worldwide

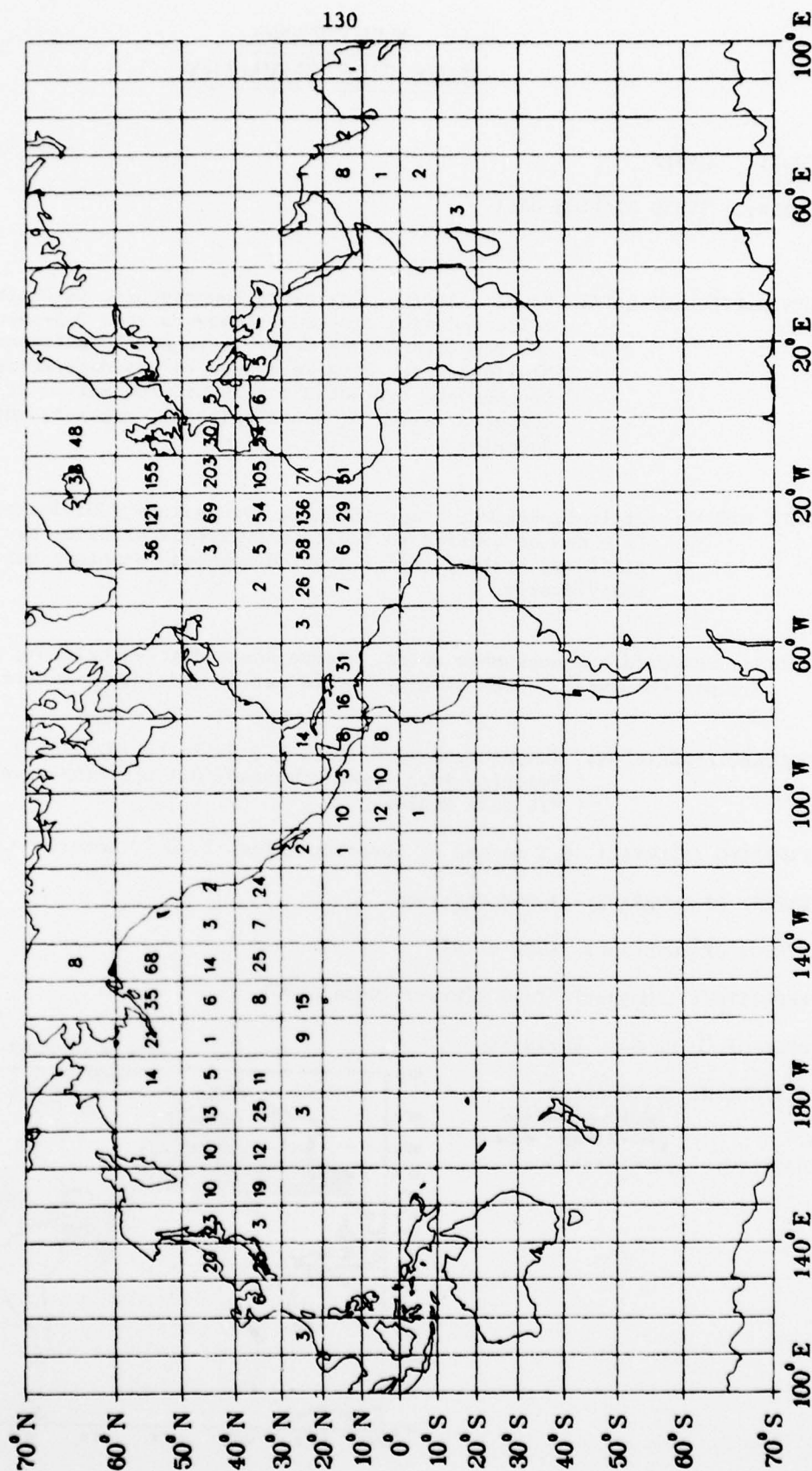
CUSTODIAN: R. Rushton
(202) 433-2847
(601) 688-4220

BACKLOG: 1,139 stations



DISTRIBUTION OF SVSTD STATIONS

By 10 Degree Squares
(1908 Stations)



AS OF JANUARY 1977

SOUND VELOCITY-SALINITY-TEMPERATURE DEPTH (SVSTD)

INTRODUCTION

The SVSTD Data File consists of data from over 3,000 stations collected by the Naval Oceanographic Office, of which 1,908 are edited, corrected, and in the active file. Data coverage is primarily of the North Atlantic and North Pacific Oceans.

DATA COLLECTION SYSTEMS

The file contains sound velocity, salinity, temperature, and depth data measured with Plessey Model 9006 or 9040 sensors at a 0.5-second sampling rate. Temperature and salinity data were corrected based on comparisons with simultaneously collected Niskin sampler data. Depths were corrected for in-situ density, and all data are reported as one-meter averages. The accuracy and precision of these data are considered to be within the following values:

<u>Parameter</u>	<u>Accuracy</u>	<u>Precision</u>
Temperature	$\pm 0.02^{\circ}\text{C}$	0.01°C
Salinity	$\pm 0.02^{\circ}/\text{oo}$	$0.01^{\circ}/\text{oo}$
Depth	$\pm 0.25\%$ full scale	0.1% full scale
Sound Velocity	*	0.1m/sec
Computed Sound Velocity	$\pm .3\text{m/sec}$	NA

*Observed sound velocity gradients are used for quality control of temperature and salinity data; corrections for offset are not applied, since sound velocities are routinely computed.

DATA SCOPE AND FILE CHARACTERISTICS

Station data and computed sound velocity, sigma-t, and specific volume anomaly are stored on magnetic tape. Entry of data into the file updates a master directory containing station identification information. This directory may be queried as to data availability by location, date, platform, cruise, and/or station number. Retrieval of data is limited to complete stations which may be outputted on magnetic tape or as listings or profiles.

APPLICATIONS

The high vertical resolution data in the SVSTD Data File are primarily used in their present configuration as the source for building working data files, such as sound speed models of various ocean areas. From these working files specific products such as sound velocity provinces can be generated.

PLANS FOR THE FUTURE

The SVSTD Data File is in the process of being compressed in a manner similar to the Ocean Station File. This will allow direct, rapid access to the data and the application of user programs for the generation of a variety of products. Conductivity-Temperature-Depth (CTD) devices are being tested as possible improvements to SVSTD's for use on specialized surveys.

NAVOCEANO
DATA FILE SUMMARY

CODE: 34322

DATE January 1977

TITLE: RANDOM SEA SURFACE TEMPERATURE

DESCRIPTION OF DATA: Continuous analog recordings of sea surface temperature data are collected using a quartz thermistor sensor. Data are also digitally sampled every 10 seconds and averaged at 1-minute intervals.

DATA FORMAT: Rolls of analog data and digital data on magnetic tape

UNITS: Degrees Celsius

ACCURACY/PRECISION: ± 0.1 degrees Celsius

SAMPLING INTERVAL: Continuous

EXTENT OF COVERAGE: 166,126 miles of track

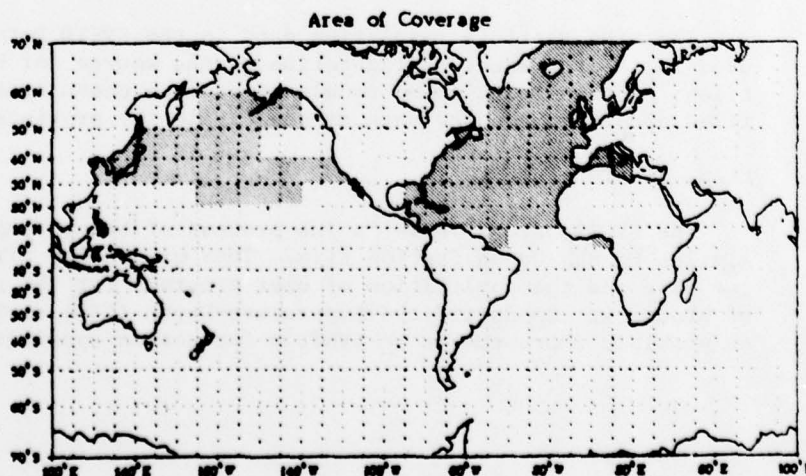
PERIOD OF COVERAGE: 1971-1976

REPOSITORY: Code 34312

AREA OF COVERAGE: Northern Hemisphere

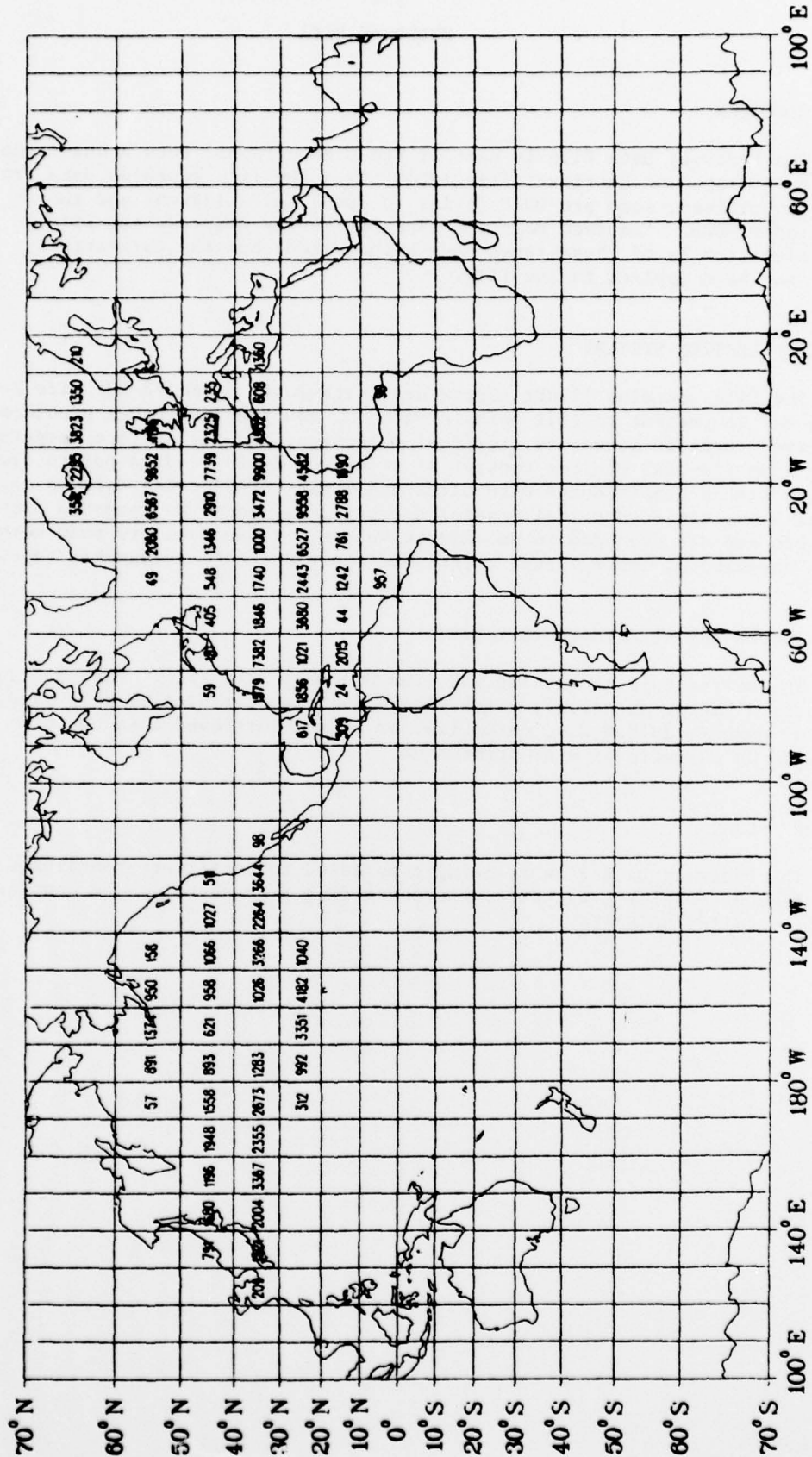
CUSTODIAN: *C. Reed Jones (601) 688-4511*
~~R. S. Rushton (202) 433-2847~~

BACKLOG: None



DISTRIBUTION OF RANDOM SEA SURFACE TEMPERATURE DATA

By 10 Degree Squares
(166, 126 Miles of Track)



AS OF JANUARY 1977

UNDERWAY DATA

INTRODUCTION

The Underway Data File is part of the Oceanographic Data Acquisition System-Storage and Retrieval File (ODAS-SR). The file contains data from over 90 cruises, some pre-ODAS (prior to PDP-9 installation) and the remainder ODAS. Nineteen magnetic tapes currently comprise the file. Profiles from 14 of these tapes have been edited, but the corrections have not been applied to the file.

DATA COLLECTION SYSTEMS

The file contains 12-kHz narrow beam bathymetry (Some 12-kHz wide beam data may be present to fill voids created by equipment or other problems.), observed magnetic intensity, residual magnetics, and sea surface temperature. Data from pre-ODAS cruises consist of selected, 5-minute data points from analog traces supplemented with highs and lows. ODAS cruise data on the other hand, are automatically sampled every 10 seconds via readouts from sensors and are averaged to one-minute values. These data are then merged with one-minute, interpolated geographic positions onto a magnetic tape.

DATA SCOPE AND FILE CHARACTERISTICS

The merged tape is entered into the Underway Data File. Each entry updates a master directory, which can be searched for data by ship name, cruise number, Julian day, date/time, or area. Retrieved data can be entered on magnetic tape or printed out.

FUTURE PLANS

The Underway Data File is being compressed to facilitate handling ease and lessen computer usage time, thereby aiding user access. The compressed file is called SAGEBATE.